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Further Field and Laboratory Observations in connection with Canine Distemper Prophylaxis.*

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Just over a year ago I had the honour to present to this Society a paper on "Canine Distemper Prophylaxis[1]" and you were good enough to invite me to come back in a year's time to tell you something of what might have transpired in the interval. At the risk of boring you, for I feel you have heard sufficient on the subject for some time, I am giving this paper to keep the promise I made last year.

You will remember that in the previous paper we discussed some of the results of the use of distemper vaccine and virus made by us according to the method originated by Laidlaw and Dunkin, and grouped the results broadly as unsatisfactory and satisfactory. Under the "unsatisfactory" heading we attempted to discuss the probable causes of the acknowledged failures of the vaccine and virus, with special reference to the occurrence of severe reactions with symptoms simulating true distemper soon after treatment, and the failure of the material to create immunity as evidenced by the development of distemper in dogs when exposed to the naturally occurring disease weeks or months after the treatment. We have given much time and have carried out much work in connection with these two points and we feel we have now arrived at a stage when such unsatisfactory results can be overcome. Everything depends on the quality of the vaccine used and the potency of the virus injected and I propose to outline how the preparation of these materials has been altered and how they can be produced in a satisfactory state.

Our first problem was to study the viability of virus. We had always realised that the virus of canine distemper was highly unstable and rapidly became inactive under ordinary conditions of temperature, but the results of some of our series of experiments (an example of some results is shown in Chart I) caused us some surprise.

Chart I.

EFFECT OF EXPOSING SALINE EMULSION OF VIRUS-INFECTED TISSUE TO ROOM TEMPERATURE.

Original infectivity of virus in ferrets—0·01-0·001 mgm.

Batch of Virus.	*Exposure at Room Temperature (Days).*				
	1.	2.	3.	4.	6.
A	L				
B		LL			
C	+	+	+	L	L

L = Ferret not infected with 2·5 mgm. spleen emulsion.

\+ = Ferret infected with 2·5 mgm. spleen emulsion.

In each, tissue kept frozen and used in control ferret infected.

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It is, of course, easy to be wise after the event and we to-day devoutly wish that before commencing issue we had asked for another six months in which to test thoroughly the viability of virus. But the pressure to issue was great, the public demand and the demand from veterinary surgeons was insistent and the burden of work left us insufficient time, space or experimental animals to do experimental work. To prevent any possibility of misunderstanding we may say here that never have we had any difficulty *in the laboratory* with the original Laidlaw-Dunkin vaccine-virus method of immunisation. It is with the general broadcast issue to the veterinary surgeon that we are dealing to-night. As soon as we had clear evidence that some of the virus sent out in the past was unable to withstand transport conditions, the issue was withdrawn and we commenced a long series of experiments to test the viability of liquid virus. Laidlaw and Dunkin, with great kindness, allowed us to go to Mill Hill and see every detail of their method of preparation of virus. Though by rigid adherence to their technique we could, in many instances, obtain a virus with long life, irregularities frequently occurred and after a considerable amount of experimentation we were convinced that the viability of liquid virus could not be trusted sufficiently to justify its use on the commercial scale. We gather that experience has led American workers to come to the same conclusion which we reached at an early stage, and, so far as we know, liquid virus is not being issued commercially anywhere in the world. We had for some time been experimenting with dried virus to meet the need of immunisation overseas and immediately we obtained the irregular results above described we concentrated all our efforts on the production of stable dried virus for use in England. In passing, it may be of interest to recall that during the first period of issue the number of complaints represented but a small percentage of the total doses issued, and the number of proved instances of failure was smaller still.

Double Vaccine.

Part of our experimental programme embraced a study of the value of two doses of vaccine as a method of producing immunity and by the time it was decided to suspend the issue of liquid virus, some experiments on this point had yielded results. We had injected groups of susceptible puppies with two doses of vaccine at an interval of 14 days and had isolated them against all possible sources of infection with distemper virus. At intervals, puppies were removed from their isolated compound and were either injected with many sure infecting doses of virus or exposed to natural infection under conditions in which susceptible puppies become infected. The results of such experiments strongly suggest that two doses of the vaccine used would cause the development of immunity to a degree sufficient to protect the animal for at least several months. About this time also we had heard from several veterinary surgeons that,

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unknown to us, they had adopted the method of injecting two doses of vaccine without the use of virus and had experienced results which satisfied them that the method was of value in immunising dogs. On the assumption that our experimental evidence was reliable, veterinary surgeons who desired to carry out protection work in dogs were acquainted with our work and vaccine was presented to them to be injected in two doses at 14 days' interval. Thus, when the issue of virus in a liquid form was suspended the double vaccine method was made available to veterinary surgeons willing to adopt it, and several thousand dogs have been treated. For a considerable time we had no unfavourable reports, but suddenly we received several and in three instances we were able, by the courtesy of M. F. H. and others, to prove that pups which had received double vaccine were not protected against the injection of a full dose of live, fresh virus. On the other hand, we have many good reports in which it seems evident that the immunity conferred by the double vaccine has been lasting, in that exposure to infection several months after treatment has failed to cause illness. Some veterinary surgeons seem so convinced of the success of the method that they are not inclined to revert to the use of vaccine and stable virus.

The failure to produce lasting immunity in some instances by double vaccine injected may be accounted for as follows. We know that the injection of one dose of potent vaccine will protect dogs against an injection of virus for 14 days at least. (The usual procedure in the use of vaccine and virus is to leave an interval of 14 days). Our experimental work shows—and there is field evidence of this—that the protection lasts for at least three weeks and even longer. It follows on general immunological grounds that a second dose, given at the appropriate time—which we believe to be two-three weeks after the first—will raise that immunity considerably and prolong it. If the vaccine used be highly potent then the immunity produced should be of high order. The variation in the results may therefore be due to the quality of the vaccine used. All batches of vaccine are required to pass a test showing that a dose of 5 c.c. will prevent illness in injected dogs when a dose of virus containing many infecting doses is given seven days later. This means that in tested vaccines there is a standard below which they must not fall. The test does not indicate how far *above* the standard any batch is, and it is possible that the batches of vaccine used in our experiments and by veterinary surgeons who have experienced successful results were of very high order compared with those used by others whose results have been poor.

We do not believe that even two doses of vaccine will confer a life-long immunity, but that the treated dog which becomes absolutely and solidly immune has been exposed to virus infection at some stage when its immunity from the two doses of vaccine was sufficiently high to prevent any marked reaction from the action of the virus. In the case of the poor results among foxhounds and kennelled dogs generally, compared with the high proportion of satisfactory results among individual dogs, the chance of the latter type picking up infection earlier than the former must not be overlooked. We still have a considerable amount of faith in the double vaccine method in producing an immunity of long duration and it is possible that by using vaccine of the quality we can now produce, the method will be productive of more consistent, satisfactory results. We are still investigating the method.

Spleen and Gland Vaccine.

Our original method of preparing vaccine was to inject susceptible puppies with virus, kill them at the appropriate stage of infection, remove the liver, spleen and mesenteric glands and use a mixture of these tissues, carrying out the Laidlaw-Dunkin technique. Every batch of vaccine so made was tested for potency and so variable and disappointing were the results—necessitating the discarding of much vaccine as unsuitable for use—that a further examination of the immunising values of the various tissues was undertaken. Laidlaw and Dunkin told us that some of the best vaccine they had made contained spleen and gland pulp only. We confirmed this and then decided to use spleen and mesenteric glands only. Vaccine made from these two tissues is of a consistent high order of potency, as shown by a reduction from 5 c.c. to 2 c.c., or in some cases 1 c.c., in the dose of vaccine necessary to protect against virus in our testing experiments.

Dried Virus.

The study of the preparation of virus in a stable form has been productive of good results. We realised early that the only possible method to prepare such a product was by some process of drying the infected tissue into a powdered form and then preserving it in such a way that it remained dry. During the past year we have, by constant experimentation, evolved a method which we now use. This coincides with that recently described by Laidlaw and Dunkin[2]. We emphasise a high concentration of virus in the tissue to be dried, the use of a low pressure, drying at a temperature of -10° to -15° C., the removal of all water and water vapour down 1-2 per cent. (it cannot be conveniently reduced much lower), exclusion of all chances of introducing moisture during the process of filling after drying and the use of an inert gas like nitrogen, which must be free of water vapour, as an atmosphere in the container tube after drying. It has been only after many experiments and attempts that we are satisfied that a really stable virus can be produced. We have also tried drying the actual saline solution of infected tissue in tubes. This latter method is highly satisfactory; thus with one spleen emulsion so dried we were able to send samples to South Africa and on their return they were still infective.

Dried virus kept at cold temperature (±5° C.) will retain its virulence for many weeks or months. Chart II shows the results of testing such a virus. If such a batch be removed from the cold room and kept at room temperature its virulence falls more rapidly. An example of this is shown in Chart III. Prolonged drying of virus seems to increase its stability, as shown by the experiment detailed in Chart IV, in which the life of the virus at incubator temperature is the test applied. We are now satisfied that by careful attention to drying and subsequent handling, infected tissue can be dried so that its contained virus remains stable and active for considerable periods. Samples of certain batches have been sent by us to places as distant as New Zealand and India and when tested on their return to us have been proved to be still active and infective. In order, however, to obviate

all risks of deterioration we advise that dried virus be used within four days of its receipt.

Chart II.

Life of Dried Virus at Ice-Box Temperature.

Infectivity of original tissue in fresh state—0·01-0·001 mgm.

Time in Ice-Box in Weeks.

	1.		2.		4.		6.		8.		10.		12.	
	0·2 m.g.	0·02 m.g.	0·2	0·02	0·2	0·02	0·2	0·02	0·2	0·02	0·2	0·02	0·2	0·02
A	...	†	† †		†	† †	† †		† L		† L			
B	...	†	† †		†		† †		† †		† †			

† = Infected ferret.
L = Failed to infect ferret.

Chart III.

Effect of Exposure of Dried Virus to Room Temperature.

Original infectivity of fresh tissue—0·01-0·001 mgm.

Infectivity of Dried Virus.

Days.	*Kept in Ice-Box.*		*At Room Temperature.*	
	0·2 mgs.	0·02 mgs.	0·2 mgs.	0·02 mgs.
1 ...	†	†	†	†
7 ...	†	†	†	†
14 ...	†	†	†	L

† = Ferret infected.
L = Failed to infect ferret.

Chart IV.

Life of Virus (Dried for 14 Days) at Incubator Temperature.

Held at 37° C. For

	12 hrs.	24 hrs.	2 days	4 days	7 days	14days
0·2 mgm. used ...	†	†	†	†	†	L

Controls.—14 days at ice-box temperature :—† †

† = Infected. ferret.
L = Failed to infect ferret.

Vaccine and Dried Virus.

Since December, when we were satisfied that dried virus was reliable, we have sent to veterinary surgeons well over a thousand doses of spleen and gland vaccine followed in about 14 days' time by dried virus. The results of the use of these two products are satisfactory and of the same order of success as the results recorded by the originators of the vaccine-virus method during their experimental period, and by us in our first experiment of the same magnitude. Thus, the position to-day is that, after about 12 months' intensive research, we are able to prepare for the use of veterinary surgeons a potent vaccine and an active, stable virus which will protect against canine distemper. Chart V depicts the results of testing such a vaccine and virus.

Hyperimmune Serum.

In February, Laidlaw[3] announced here that he had been able to prepare a hyperimmune serum which would confer a passive immunity against distemper virus and which, if injected simultaneously with virus, would produce an active immunity of high order. At the same meeting we described experiments confirming Laidlaw's announcement. Since then we have continued to prepare serum as material and animals became available and have sent to veterinary surgeons well over a thousand doses for use with dried virus for active immunisation of dogs and several hundred doses for the treatment of cases of so-called distemper.

At the moment we have difficulty in titrating serum. Laidlaw applies the complement deviation test to samples of serum and suggests that the complement deviating power of a serum is an indication of its protective value. We used the method for some time and it appeared to work, but discrepancies began to appear and we have picked out two sera where the order of protection in dogs is the reverse of that suggested by the deviation test. We still test all serum by the deviation method but we do not, for the moment, accept it as a complete measure of value. Until some reliable, quick test is available we must continue to test serum in dogs, an example of which is given in Chart VI. This involves a large amount of trouble for, at the best, a dog yields little serum and it is necessary to test each individual serum before blending can take place. Of course, no matter what *in vitro* test may be evolved, the final test of protective value must be carried out in the living animal.

Serum-Virus Simultaneous Inoculation.

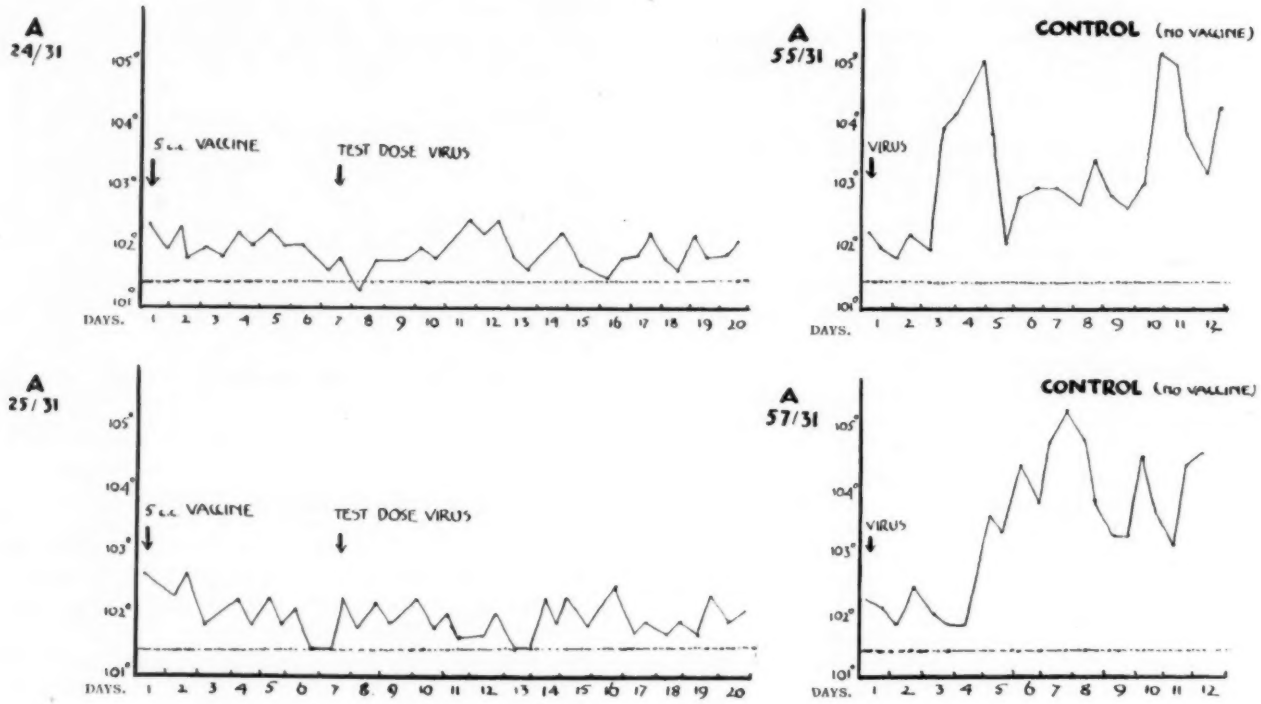
Reports of the experiences of veterinary surgeons with this method of immunising dogs are beginning to come in. The majority of the reports are satisfactory.

The few unsatisfactory results reported to us come under two categories—(*a*) Severe reactions within a fortnight of treatment, with or without symptoms simulating distemper; (*b*) the appearance of distemper-like symptoms long after immunisation, *i.e.*, supposed "failure of immunity."

(*a*) Regarding the former type of result, Laidlaw warned us that in a few cases a severe reaction may be noted within a week of injecting serum and virus and that a further dose of serum usually checked the reaction. We have been asked for about a hundred doses of serum to be used on dogs showing unduly severe reactions and, as far as our information goes, in all but ten cases there was an immediate response with complete recovery. The amount of serum injected with the virus may, in some cases, decide whether a severe reaction will follow. Laidlaw and Dunkin suggested that an excess of serum in the mixture above that quantity merely required for the neutralisation of the virus will not cause a reduction of the immunity produced. We were at first disinclined to accept this, but our few experiments agree with those of Laidlaw and Dunkin. However, since serum is so difficult to make and test, we cannot waste it and we aim at the use of the smallest amount of serum that is safe. In one kennel in which excessive reactions occurred and from which distemper virus was recovered from the brain of a treated dog which died, the dose of serum used was only half that issued later. In that case it seems probable that the amount of serum used was insufficient to prevent the activity of the injected virus. In another kennel in which severe reactions and losses occurred soon after injections were carried out, the presence of distemper in the kennels at the time of inoculation was proved. As with the use of vaccine and virus, the greatest care is necessary to ensure that dogs about to be injected are healthy, free from infection and free from chances of infection. Any neglect of this rule is courting disaster. Our attention has been drawn, on more occasions than

Chart V.

Testing Spleen and Gland Vaccine.



one would care to mention, to a decided lack of observation of this condition. Individual peculiarity of the dog must never be forgotten. There are dogs (as with horses, with the immunisation of which we have considerable experience) which will react to any protein injected. They are certainly few in number, but still they exist.

(*b*) In this category hounds predominate. Introduction to the kennels of hounds treated with serum and virus about 4-6 weeks previously has, in a few instances, been followed by the apparent development of distemper with losses. We have investigated two such outbreaks. In neither could we isolate the distemper virus though samples of blood, discharge, etc., were obtained from acutely affected typical cases. In one case we were able to show that *B. bronchisepticus* was present in the blood. We are still convinced that in some foxhound kennels so-called distemper is due to causes other than the distemper virus. This was clearly proved to us in a kennel in which we were assured that distemper occurred every year and on some occasions twice in one year, affecting the survivors of previous attacks with the same types of symptoms each time. In this kennel we failed to recover distemper virus from two acutely affected hounds. We try to visit every kennel so affected and obtain material for examination and we hope in the course of time to be able to make a definite statement on this important point.

Serum as a Curative.

Several hundred doses of serum have been issued for the treatment of dogs said to be suffering from distemper. We could read you extracts from letters in which the highest possible credit is given for the effects following the use of serum. In about ten cases only is the serum said to have failed to effect a cure. It is difficult to know how much weight to lay on these clinical reports. In the laboratory we find that unless the serum be given on the third, or, at latest, the fourth day after injection of virus, the " cure " of the disease is not certain (see Chart VII), and, therefore, we were at first inclined to doubt the validity of some of the clinical reports. It may be that in laboratory infection we are using an incomparably larger dose of virus than a dog ever gets at its first infection in normal life, and that the serum is as effective as some clinicians believe. We must, of course, keep an open mind on the subject until much more experience has been gained, but probably most veterinarians will feel that it is their clinical duty to use serum in all cases—certainly in early ones.

Some doses of serum have been used to protect dogs which have been in contact with distemper. All our reports on its use in this respect are good. We would not hesitate to advise its use under such circumstances, for we know from experiments that there is every chance of serum so used warding off an attack of distemper.

We have done little of importance in connection with serum concentration. Perhaps Dr. Laidlaw will tell us something of its use to-night.

Still more remains to be done on a large scale in the production and titration of serum and much more field evidence is required as to its usefulness in general practice.

References.

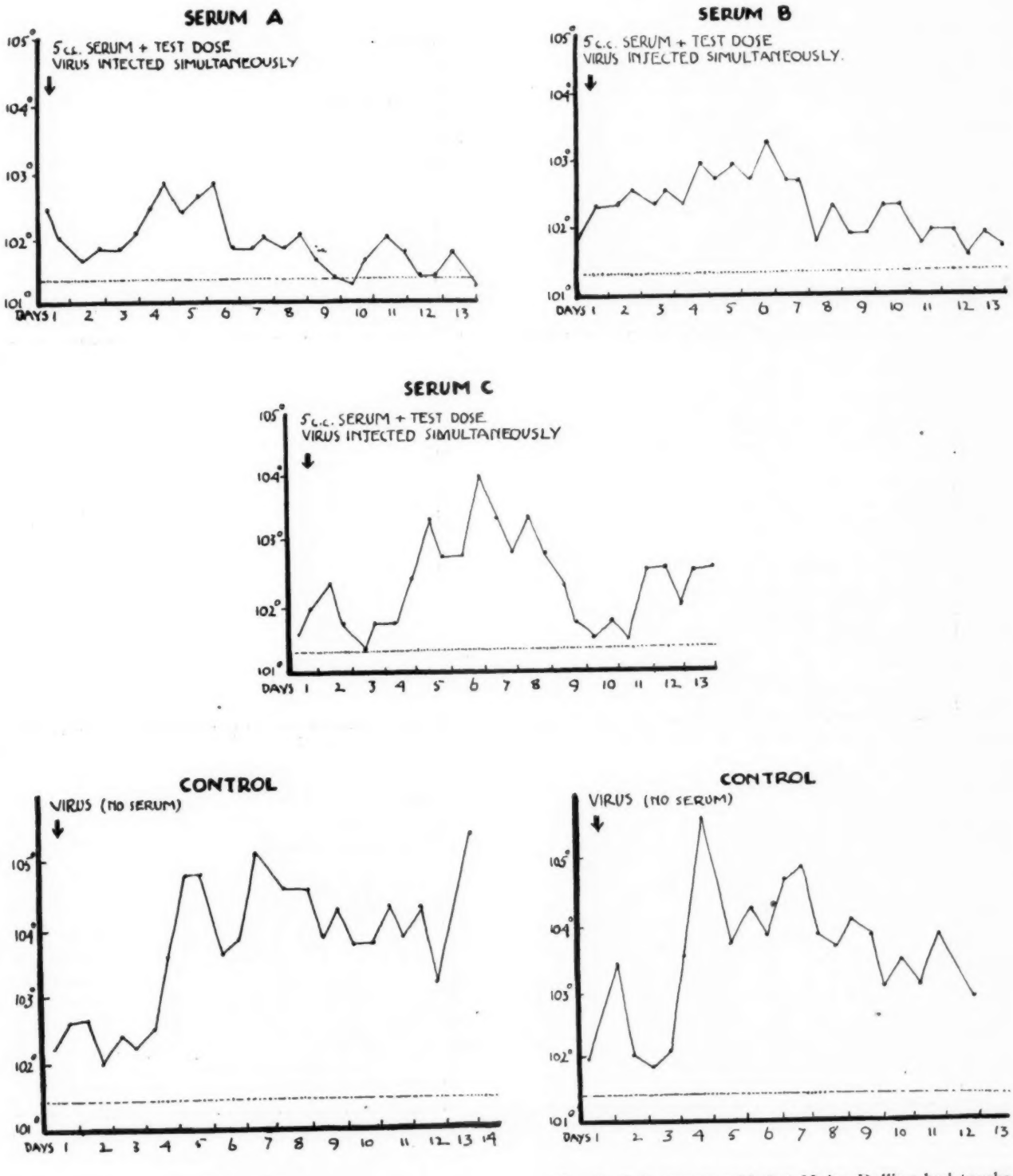
[1]Dalling, T. *Vet. Record*, 1930. Vol. x, No. 11, p. 225.

[2]Dunkin, G. W., and Laidlaw, P. P. *Journ. Amer. Vet. Med. Assocn.*, 1930, Vol. lxxviii, p. 545.

[3]Laidlaw, P. P., and Dunkin, G. W. *Vet. Record*, 1931. Vol. xi, No. 14. p. 359.

Chart VI.

Testing Batches of Sera in Dogs.



Discussion.

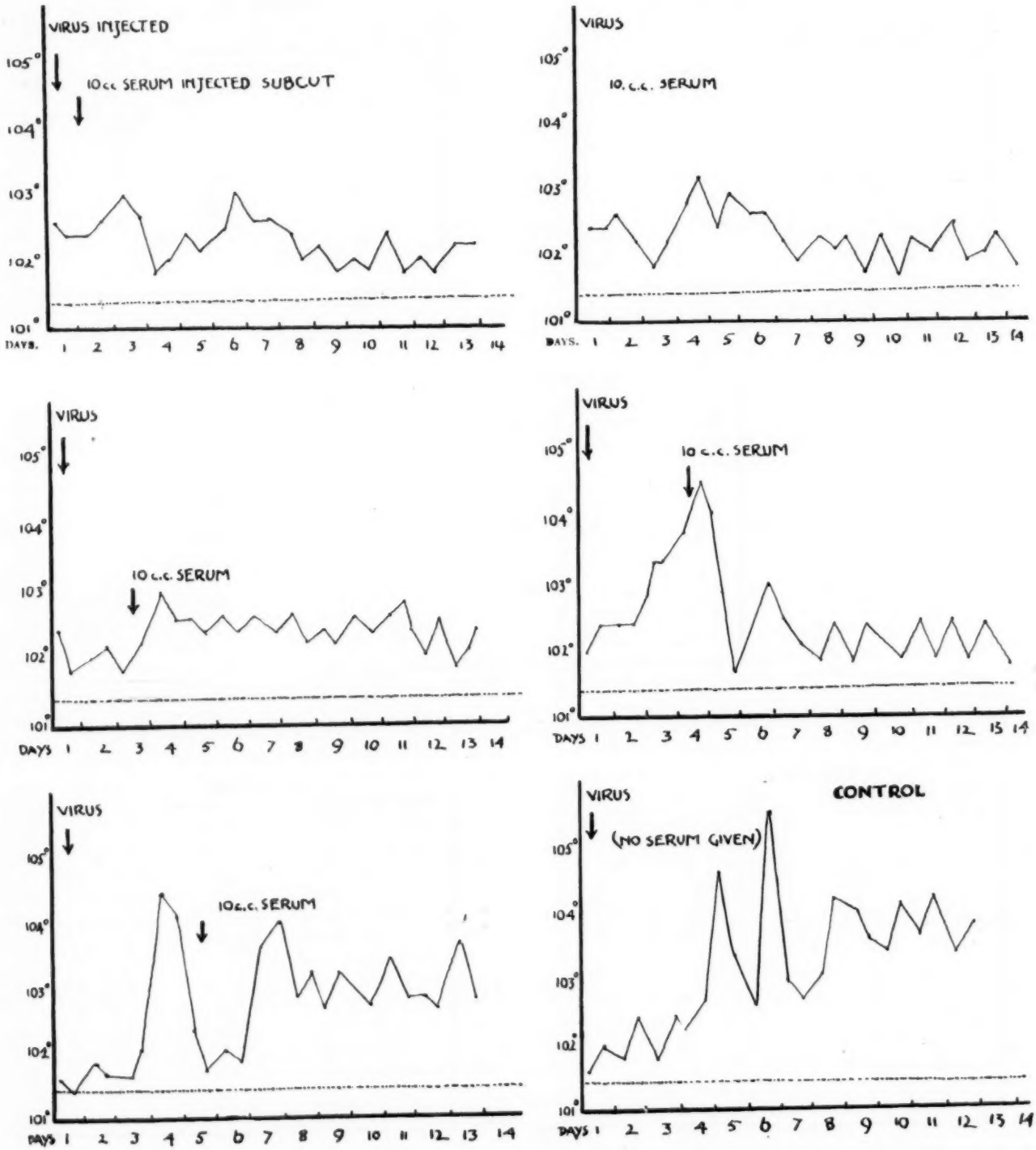
The President (Captain G. Dunlop Martin), in calling upon Dr. Laidlaw to open the discussion, described the paper they had just heard from Major Dalling as a most interesting and encouraging one, and one which they would all thoroughly enjoy reading when, in due course, it received publication in the *Veterinary Record*.

Dr. P. P. Laidlaw said that Major Dalling had touched upon a large number of points, everyone of which was of great interest to him, but he could not go into the whole series as to do so would take a great deal too long.

There were three points about which he would like to speak. In the first place, there was Major Dalling's experience of the failure to get perfect correlation between the complement fixation power of the serum and its protect-

Chart VII.

Serum Given After Virus.



ing potency. They were careful to state that they did not regard the one property as the direct measure of the other, but they had never found any great discrepancy between them. It was a disappointment to him to learn that Major Dalling, with his rather more extensive experience than theirs, had found discrepancies between them, because it did make the production of serum in large quantities exceedingly difficult. Major Dalling did not say so, but he (Dr. Laidlaw) thought he agreed with him that when one had a highly potent complement-fixing serum that would also prove to be good from a protective point of view.

In blending sera to form a large batch some rapid and simple method of assay was highly desirable and if the complement fixation test failed matters were going to be very difficult.

The second point was the resultant degree of immunity which followed the simultaneous side-to-side inoculation

of virus. So far as their reports went (they were not, as yet, very extensive) he thought that in the privately-owned dogs the results were quite good—*i.e.*, they had had reports to the effect that the dogs had been in contact with distemper cases and had shown no symptoms. On the other hand, with regard to certain kennels of fox-hounds, there had been instances where the hounds assembled in kennels had, after a time, shown symptoms that were believed to be distemper—purulent discharge from the eyes, and possibly the nose, husky cough, bronchitis and sometimes fatal pneumonia. That might affect a fair proportion of inoculated hounds or only one or two. In two cases in which they had received carcasses of hounds reputed to have died from distemper, they had conducted the usual *post-mortem* and found quite extensive broncho-pneumonia in the lungs and enlarged glands, and it was clear that the actual cause of death of the hounds was the broncho-pneumonia. Tests for distemper virus were put up by injecting ferrets with spleen tissue. In two instances sufficient time had not elapsed to give them an answer to the result of the inoculations. With a view to hurrying matters, they had also emulsified the spleen and tested it against their standard distemper antiserum, to see whether or not it would fix complement—assuming that, if it would do so, virus must be present in the spleen of the dog. In both the dogs to which he had referred neither spleen fixed complement, and he thought it highly probable that neither of the ferrets would show any distemper symptoms.

They did, however, in the case of one pack, receive a hound carcass in which there was extensive broncho-pneumonia, and in that case *Bacillus bronchisepticus* was isolated in almost pure culture from the lungs and the two ferrets inoculated with spleen went down with typical distemper—so that there was no doubt that there were cases where the immunity had not been durable and there were other cases where it seemed that a certain proportion of hounds were suspected.

Although they had failed to prove the presence of virus in suspected cases, he was always suspicious that the virus must have been there at one stage of an epidemic illness, even though they had not been able to find it, and he would like to obtain the views of Fellows as to whether an epidemic of pneumonia, apart from the virus disease, was possible.

The third point upon which he would like to touch was treatment. He had hoped that by that time he would have had a certain amount of experimental data on treatment, but unfortunately he had not been able to carry out those experiments, and his experience as to the nature of serum in treatment was solely the cumulative experience of veterinary surgeons who had reported on cases to him.

There was no doubt in his mind that in certain cases a full 10 c.c. dose of concentrated antibody (which was equivalent to 50 c.c. of serum), given early, was of the very greatest benefit, but if they studied all reports of the use of the serum in the field it must be said that some of the results were quite disappointing.

Major Dunkin had visited and injected a number of hounds with serum and concentrated antibody and had subsequently sent further supplies to the veterinary surgeons who normally attended the hounds. The final opinion was that although the serum had some temporary beneficial effect in these hounds, it was not sufficiently lasting and the great majority so treated ultimately died.

In the same way he visited a number of dogs along with Major Dunkin. Serum was given and the immediate effect seemed good, but after a time the temperature ran up again and the mortality in that group was somewhat heavy. He believed that if they had been on the spot with unlimited antibody they might have produced better results in those cases. The antibody was tedious to make, unfortunately.

He would be very interested to hear the remarks of anyone else who had used serum in treatment and who had any experience of failure to secure immunity as the result of simultaneous inoculation of serum and virus from side to side.

Dr. R. A. O'Brien, having expressed his cordial thanks for the invitation extended to him by the Society to be present on that occasion, said that there were many points which had been running through his mind while Major Dalling had been reading his paper. He still retained a very vivid memory of the typical pictures of distemper produced by him with the *Bacillus bronchisepticus* and also with streptococci. What the relations of those two organisms were to many of the cases of distemper met by veterinary surgeons in their practices was one of the fascinating problems upon which they hoped to be able to get some light in the future, because Dr. Laidlaw and Major Dunkin had clearly marked off the virus disease, and now that the preparation of dried virus had solved a number of their problems one could hope to be able to investigate interesting questions of that kind.

They were not at all clear to-day as to what was due the pneumonia that ran through kennels—whether it was the virus itself or a secondary invader which was responsible. He was convinced, however, that epidemics could occur without virus.

Major Dalling had been exceedingly frank in all that he had said about the failure, in a small percentage of instances, of virus, as used in the early part of last year, to act as a satisfactory second inoculation in the first Laidlaw-Dunkin method of immunisation. If Major Dalling had to stand on the penitents' bench, he would have to join him, but they, of course, always had been uneasy about liquid virus: it was very alien to their whole training to send out material that could not, from the nature of it, be tested before issue for potency and freedom from undesirable toxicity—one could not do that with a liquid virus; with a dried virus one could.

So far as the future was concerned, he himself was not clear what prophylactic they would all favour two or three years hence. The vaccine and virus method, when the products had been satisfactory, had not failed in the past and he did not think it would fail in the future. Whether serum and virus would replace it, because of the great attraction of the one-dose method, he did not know. He thought Laidlaw and Dunkin had pointed out clearly that the serum-virus method must still be regarded as more or less an experimental one. On the whole, the results they had got from veterinary surgeons were very highly in favour. Major Dalling had loaded the scales against himself by reading all the unfavourable reports that had come in, but he had not given them all those which were favourable.

He (Dr. O'Brien) did not know which of the two methods would be the method of choice in a few years time.

Captain R. J. Stow said that he should like to thank Major Dalling very much for his paper and for the information which had been afforded them therein. (Hear, hear.)

There was one question, which arose a little while ago when he inoculated a dog with serum and virus together, as to whether or not that dog would be in any way infectious to other dogs if it went into a kennel with other dogs straight away.

With regard to treatment with serum, he had three cases in which he had used it. In the first case the owner rang him up one Sunday morning, saying that the dog's temperature was 104° F., and that there was a watery discharge from the eyes and nose and he thought the dog was going into distemper. He (Captain Stow) verified the dog's temperature and, as he happened to have 5 c.c. serum at the time, he put it into the dog. The owner 'phoned him at six o'clock and told him that the animal's temperature was normal. He (the owner) took the temperature every few hours afterwards, but it never rose over 102·5°, and the dog was otherwise quite normal.

In another case the dog was starting fits—it was three months old—and the owner thought it was commencing hysteria. The temperature was 104° F. He gave it 10 c.c. serum, the temperature fell to normal, and the animal went on well afterwards.

Mr. R. E. C. Bullen enquired of Major Dalling whether the serum and dried virus were now available for purchase by members of the profession.

Major T. Hicks said that he would like to add his quota of thanks to Major Dalling for his paper on that most important subject and to recount the little experience he had had in connection with the subject under discussion.

He must say that, *in toto,* that experience had been very good. Out of a kennel of 24 rough-haired terriers, 12 were picked out which were thought to be potential winners, and all were vaccinated by the former vaccine-virus method—every one with success. Some months afterwards the owner had a number more come in and he thought he would have these done. He (Major Hicks) rang him up to tell him that he must not put the terriers upon which he (the speaker) had used virus in with those that were now being inoculated.

Unfortunately, the owner risked it, and all the new batch went down with the most violent attack of distemper. He (Major Hicks) gave them all a dose of vaccine on the fourth or fifth day, and the dog that had the worst attack had three doses. That dog had since won on the show bench.

Major F. J. Taylor observed that he had not had a very extended experience of the original vaccine-virus method which was first introduced by Laidlaw and Dunkin, but he had a record of 14 cases. Twelve of these were perfectly successful, but two failures occurred with what he termed "street" dogs, *i.e.,* dogs which ladies had bought at dog shops when on a visit to London, which had probably slept with them in town for the night and which had been brought to him on the following week for inoculation against distemper after being exercised in the parks and introduced to other friends' dogs. He should like to ask Major Dalling how he could possibly guard against secondary infection in cases like that and how he diagnosed the presence of incipient distemper at the time of inoculation: he (Major Taylor) had been practising for 40 years and he could not do so.

Professor G. H. Wooldridge said that, in regard to the question asked by Dr. Laidlaw concerning infection with *Bacillus bronchisepticus* as distinct from distemper infection, he was of opinion that there were two distinct infections: he felt certain that one could get acute outbreaks of epidemic broncho-pneumonia in the dog absolutely independent of distemper, as described in his contribution on the subject in his Encyclopœdia of Veterinary Medicine, etc.

The Reply.

Major Dalling expressed his appreciation of the manner in which his paper had been discussed: they had not said very much to which he could reply, but he would make one or two remarks on such points as he could deal with.

Dr. Laidlaw mentioned three points, and the first concerned complement binding. He (Major Dalling) thought that more work must yet be done on the complement-binding value of serum in comparison with its protective value: it would appear that sera with low complement binding properties might or might not be bad sera.

The question of immunity following the serum-simultaneous method of vaccination was mentioned by Dr. Laidlaw, who cited one case in which he had found a virus where a breakdown occurred, but he (Dr. Laidlaw) forgot to say that it was in dogs immunised from material which he (Major Dalling) had prepared, from which he got the virus. He (Major Dalling) was not quite sure that immunity broke down. Most of the cases he had had to deal with were those in which symptoms had appeared in fox-hounds a month or six weeks after they had been introduced into the kennels. It seemed to be probable that, when serum and virus were injected into dogs, unless the serum were of very high potency the virus was not checked at once—it got ahead of the serum. A lot of those hounds, in his opinion, were suffering from mild effects of virus for some weeks after they got serum and virus, and when they went into the kennels the virus was given every opportunity to create further infection.

Dr. Laidlaw cited cases to show where, in his opinion, serum treatment had done little or no good, and in outbreaks of so-called distemper in fox-hound kennels their experience coincided more or less with Dr. Laidlaw's.

Captain Stow had asked him that old question—"If you put virus into a dog, will it infect other dogs?" They had one case on record of that happening.

In reply to Major Taylor, he had not the slightest idea how to diagnose incipient distemper: it took him all his time to diagnose real distemper. (Laughter.) He would point out that if a lady brought a dog, from London, which had probably been walking about the streets, it was just as well to keep that dog under observation for some time before inoculating it.

In answer to Professor Wooldridge, one wanted to get these cases at the height of the disease; if that were always done, the problem would be solved.

Replying to Mr. Bullen, their stocks of serum and virus were getting very low indeed, and he would like his questioner to discuss that matter with Dr. O'Brien, within whose province the matter of commercial distribution lay. At the present time he (Major Dalling) was giving it to all veterinary surgeons who asked for it.

"Our Servant the Horse."

This booklet—admirable alike in object and presentation, and with which we shall deal more fully next week—has been written by Major-General Sir John Moore as an appreciation of the services rendered by the horse during the Great War, and in aid of the Re-building Fund of the Royal Veterinary College. Copies are available, free of charge, upon application, from the Secretary, Royal Veterinary College, London, N.W.1, and Sir John Moore would be very grateful if members of the profession would help him to distribute copies to any of their friends or clients whose sympathy with the cause is deemed sufficient to render them potential donors to the Fund.

A Sheep-Worrying Decision.

An interesting judgment in regard to sheep worrying has been given in the House of Lords. Two dogs belonging to different owners, but accompanying each other, had worried a flock of sheep, killing some and injuring others, the damages being assessed at £60. The question arose whether the owners were jointly and severally responsible or whether the damage should be divided between them. The Sheriff-Substitute gave judgment against the defendants jointly and severally, but on appeal to the Court of Session that Court held that Paterson, one of the dog owners, was liable for half, on the ground that the dogs were jointly concerned in the damage, and that in the absence of evidence of what portion of the damage was done by either dog, the damage should be equally apportioned.

Giving judgment, which was unanimous, Lord Hailsham said that he thought that each dog had caused the whole damage as the result of the dogs acting together. Each owner was responsible for the whole of the damage. The decision of the Court of Session should be reversed, and that of the Sheriff-Substitute restored. In the present case it was admitted that the two dogs were acting together, and on that admission each owner was liable for the whole of the damage, because each dog in the eye of the law did the whole damage.

Errata.—It is regretted that, in connection with the publication in our last issue, in our clinical section, of cases presented to the Lancashire Division Annual Meeting held at Manchester on March 5th, some confusion of material occurred. In the result, the photo published to illustrate the interesting case "Metacarpal Constriction in a Terrier," related by Mr. J. H. White, did not show any diseased condition of the metacarpal bones, while Mr. Warwick Fowle writes, concerning the published account of the second of his "Two Cases of Mistaken Diagnosis," (page 605): "It will, I trust, be evident to every reader that Warwick Fowle is not the only person guilty of making mistakes."

Immunisation against Distemper.

Report on Progress of Research.

A meeting of the Field Distemper Council held on Monday under the presidency of the Duke of Portland approved a report submitted by the Distemper Research Committee.

The investigations reported upon dealt with further work on the vaccine-virus method of immunisation, with particular reference to difficulties encountered under the conditions of large-scale production and commercial distribution; and new research work directed towards the production of an anti-serum for distemper. The work continues to be done by Dr. P. P. Laidlaw and Mr. G. W. Dunkin, in the farm laboratories of the National Institute for Medical Research at Mill Hill.

The report states that, although the preparations have not been on sale, the Wellcome Laboratories have steadily continued to issue free supplies of vaccine and virus to many veterinary practitioners. The results have been closely watched in order to value the improved methods of production and testing that have been introduced. The committee understand that these preparations, and also the new antiserum, will shortly be placed on sale to all veterinary practitioners.

It is revealed that Dr. Laidlaw and Mr. Dunkin, who established the vaccine and virus method of immunising against distemper, have added an anti-distemper serum to these preventives. Great hopes are felt of its value.

Dr. Laidlaw has expressed a wish to continue the research on distemper for another year or two.—*The Times.*

Royal Veterinary College.

Visit of Members of Breed Societies.

Members of breed societies were invited to be the guests of the South-Eastern Jersey Club at the first of the season's meetings, held at the Royal Veterinary College on Thursday, May 28th, and a very large audience assembled in the large lecture theatre in response to the invitation issued by the secretary, Miss Bradley. The aim was that the various breed societies should come into close contact with the Royal Veterinary College and the educational and research work which is being done not only for the training of the veterinary student but on behalf of the breeders and owners of valuable cattle and other farm animals.

The chair was taken by Lieut.-Colonel Sir Merrik R. Burrell, who, in addition to being a prominent member of the South-Eastern Jersey Club, is the chairman of the Board of Governors of the Royal Veterinary College. With him were Major-General Sir John Moore and Professor F. T. G. Hobday, the Principal of the College.

The chairman expressed his warm appreciation of the manner in which the South-Eastern Jersey Club is supporting the appeal for the Royal Veterinary College on behalf of the rebuilding and equipment scheme. He stated that the Club had already subscribed more than £200, and hoped that the challenge which had been issued by the Council of the Club to other breed societies, to endeavour to rival this amount, would be successful.

Professor G. H. Wooldridge gave a lecture in popular language on the subject of contagious abortion.

Professor Hobday showed two films illustrating various illnesses and affections of animals, and demonstrating very emphatically the great value of the cinema film for educational purposes in teaching the veterinary student.

After the meeting the visitors were conducted round the museum, where many specimens of interest were examined, and the research department, where Dr. F. C. Minett, the director, and his staff showed the party the work being done to endeavour to find a preventive and curative treatment for Johne's disease and mastitis.

Translation.

A Short Description of the Immunisation of Ferrets against Distemper by the Laidlaw-Dunkin Method.*

W. Hinz.

At the time of the Eleventh International Veterinary Congress in London, Laidlaw and Dunkin intimated that they were willing to supply some material for the immunisation of ferrets at the Small Animal Clinic of the Berlin Veterinary School.

On October 7th, 1930, eight doses of the vaccine were received at the Clinic by air mail and were used forthwith for the subcutaneous inoculation of eight ferrets about five months old. A further two ferrets were not injected but were kept along with the others as controls. On the eighth day following the inoculation of vaccine, distemper virus was received by air mail from England for injection into the above 10 ferrets. 0·5 c.c. of the virus was injected into the eight ferrets which had received the vaccine, as well as into the two control unvaccinated animals. The temperature of the eight injected ferrets, taken for 24 days, varied between the following points:—

No. 1	... 38°-39·5° C.	No. 5	... 38·5°-39·7° C.
No. 2	... 38·3°-39·5° C.	No. 6	... 37·8°-39·3° C.
No. 3	... 37·7°-39·5° C.	No. 7	... 38·1°-40·1° C.
No. 4	... 38·1°-39·8° C.	No. 8	... 39·1°-40·5° C.

The appetites of all these animals remained good for the 24 days during which they were under observation, and never at any time was there any indication of the slightest sign of illness except that No. 8, during the 15th and 16th days, passed blood-stained fæces.

The two control ferrets up to the seventh day after receiving virus showed temperatures of from 40·2° C. to 40·3° C., from the seventh to the ninth day the temperature fell to between 39·4° C. and 39·6° C. and then rose again to between 40·2° C. and 40·6° C. From the ninth day both control ferrets showed a copious purulent discharge from the eyes, greatly increased respirations and entire loss of appetite. The body temperatures fell and on the 11th day registered 34·6° C. to 35·5° C. During the night of October 25th-26th both died. On *post-mortem* an acute catarrhal enteritis was found in both animals. Histological examination of the brain showed, as in distemper cases, no characteristic changes, there being no evidence of lymphocytic encephalitis. No specific micro-organisms of pathological importance were recovered. (This work was carried out by the Institute of Hygiene of the School, to whom our thanks are due.)

The eight treated ferrets have been kept in the distemper ward of the clinic and from their introduction there till to-day (March, 1931) they have never shown the slightest sign of illness.

To summarise, the result of the experiment in which ten ferrets were used, eight of which received distemper vaccine (Laidlaw-Dunkin) and later received distemper

* From the Small Animal Clinic of the Berlin Veterinary School. Director: Professor Dr. Hinz.

Clean Milk.

A Swindon Controversy.

Much interest has been aroused in the Wiltshire town of Swindon by a local newspaper controversy which followed the publication, in the *Swindon Evening Advertiser* of March 4th, of remarks relative to the milk supply made by Dr. Dunstan Brewer, Medical Officer of Health for Swindon.

In the course of an address to the Swindon Women's Co-operative Guild, Dr. Brewer is reported to have said that the legislation with regard to selling and handling food in this country was absolutely futile, and most of the food we ate which could be contaminated was contaminated—sometimes badly.

There was some feeble legislation dealing with both milk and meat, but it did not prevent anyone from buying them in a dangerous condition.

An expert from the United States had said of the English milk supply that it was impossible to discuss it without swearing. Every foreigner who came to England was disgusted with it. British legislation dealing with milk was elaborate—so much so that no-one could understand it.

In England people were not encouraged to sell milk in hygienic conditions, and there were more organisms in a sample of average milk than there were in sewage.

On March 16th the Swindon dairymen replied to Dr. Brewer through the Chairman of their local organisation, who quoted the following words of Earl De La Warr, Parliamentary Secretary to the Ministry of Agriculture, spoken in the course of a debate in the House of Lords :—

" I cannot help feeling that if the medical profession would talk a little less about dirty milk and do a little more to ensure the buying of clean milk, which is already on the market, they would probably do more for the nation as a whole and the agricultural industry."

The statement made by Dr. Brewer that " though we have been trying for 40 years we have never made any headway owing to the obstruction of the dairy farming industry itself," they would refute on the authority of Mr. Arthur Greenwood, Minister of Health, in an article contributed to " The Milk Industry " the previous month. Mr. Greenwood had written :—

" The Ministry of Health have taken every opportunity of emphasising the value of milk, but it remains true that the total consumption still falls short of what experience would regard as desirable in the best interests of the health of the people. The doubtful reputation which milk acquired in the past, when producers and distributors were not fully alive to their responsibilities, may in part account for this. I am glad to think that while we are still very far from perfection we have left that time behind."

The dairymen's spokesman added :—

" If Dr. Brewer was a practical dairyman he would know that the bugbear of the milk industry (the man who sells low grade milk) is rapidly disappearing, because it is a fundamental commercial principle that, prices being equal, quality always prevails."

In the issue of the *Advertiser* of March 24th, Mr. J. C. Coleman, M.R.C.V.S., of Swindon, wrote expressing disapproval of the " scaremongering " expressions " adopted by Dr. Brewer in his desire to educate the public," and stating that, to him, the legislative enactments (of the obscurity of which Dr. Brewer complained) were quite clear and understandable, his only complaint being that " the word ' may ' is used, when in most instances it should be ' shall,' thereby compelling local authorities to adopt the clauses and not leave it to their option, thus making the measures uniform throughout the country and not differing as they do now, in every county."

In the course of his reply (published a week later) Dr. Brewer said :—

"Under the present laws and customs of the milk trade, the milk supplied to the consumer may be safe, but it may not be, and what we are determined is that it shall be safe under all circumstances. Our suggestions boil down to these :—

(1) That milk shall be sold only in sealed bottles ; and

(2) That no milk other than certified milk and Grade A tuberculin tested milk shall be sold, unless and until it is pasteurised according to the definition of pasteurisation which occurs in the Milk Order.

" We admit that in the present state of affairs it is neither feasible nor desirable to make this law absolute for all districts of the country, owing to difficulties in connection with rural areas, but these difficulties do not apply to the milk supplied in towns, and we shall urge that the local authorities of boroughs shall have power to decide what grades of milk they will allow to be sold within their boundaries.

" This we are pressing for, and this we are determined to have, and until we have it the Ministry of Agriculture and the dairy industry may talk till they get apoplexy, but the consumption of milk in this country will not increase."

Mr. Coleman's Reply.

The *Swindon Evening Advertiser* of May 5th contained the following :—

" Mr. Coleman writes :—

' Sir,—In reply to Dr. Brewer's letter in your issue of March 30th. I congratulate our medical officer upon refraining from further exaggerations and unreasonable comparisons, and would like to express agreement with much that he now says. I do, however, disagree that ' Technical details would be ' uninteresting ' to readers,' as education of to-day has taught the public to ignore many facts expressed by scientists, unless they are accompanied by the reasons why.

' Dr. Brewer makes two suggestions, with the first of which I am in full agreement, *i.e.*, that milk should be sold only in sealed bottles.

' His second suggestion I would prefer, should be that only ' Certified,' or ' Grade A (Tuberculin Tested) milk,' should be recommended for young children and invalids.

' The medical officers of health being the head of the public health services, it is surprising to me that a larger number of them have not realised before now how impossible it is for them to be experts in every department of which they have control. It is to be hoped that the Chelmsford Commission, now sitting, will remedy some of the existing incongruities.

' That improvements in our milk supplies have taken place within the last decade is proved by the increased interest taken in clean milk competitions. In 1920 one such competition took place in Essex, and in 1927 competitions were held in 42 counties in England and Wales, and the production of graded milk has also shown a steady growth, from 20 farmers producing this under licence in 1920, increasing to 829 in 1929.

' Raw milk is the only article of food which contains in itself every constituent necessary to sustain life. Its great value therefore as a food, especially for young children and invalids, is most apparent.

' Artificial heat, however, has a deleterious effect upon many of its constituents, either by destroying them altogether, or rendering them more or less insoluble, which means that, being insoluble, they cannot be absorbed by the organs of the body, but pass through the body and away in the excretions.

' Among those constituents affected, the albumin becomes less soluble and digestible, and phosphorous, calcium or lime and iodine salts, which are most important factors in the formation of bone, are rendered less soluble, and with increased heat, become almost insoluble and useless.

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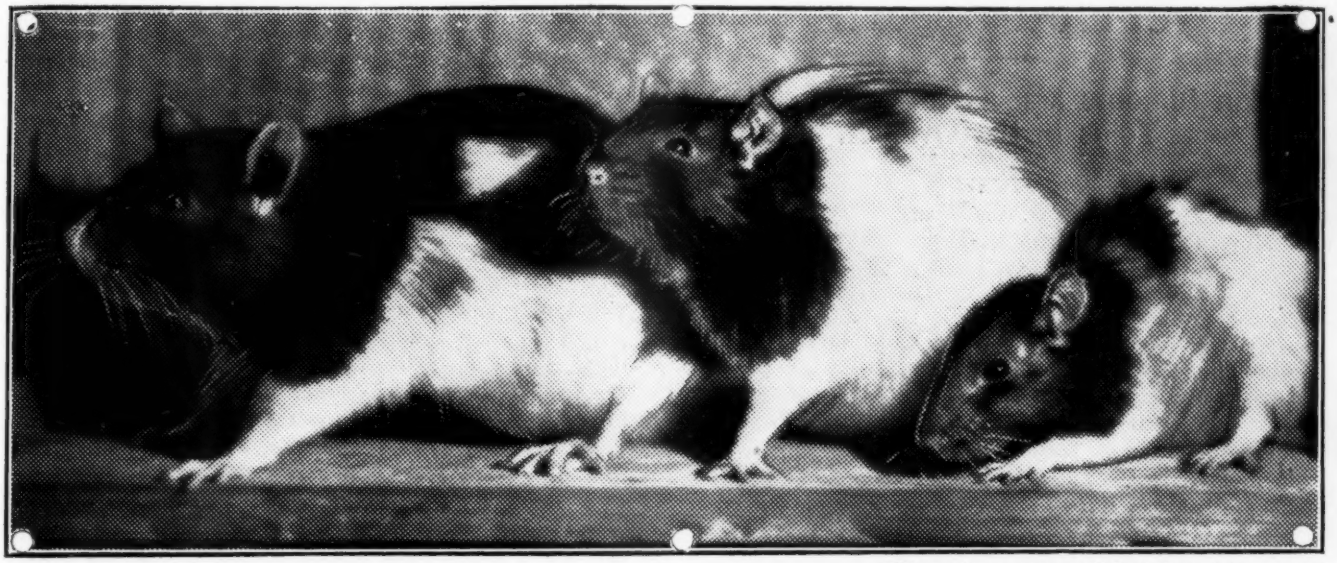
virus, is that these eight ferrets have never shown the slightest sign of illness, while the two controls which received no vaccine but virus only, died after showing symptoms of clinical distemper. Further investigations on the immunisation of dogs with the English vaccine will be undertaken as soon as the vaccine is available.



[Photo by courtesy "Swindon Advertiser."

'Many other constituents are also so altered in their composition by heat as to render them of a reduced nutritive value.

Pasteurisation of milk requires that it should be heated to a temperature of about 150° F. for 30 minutes and then rapidly cooled.

Sterilisation requires that it be heated to 212° F. for one hour and rapidly cooled.

'The photograph above illustrates one of many experiments carried out upon animals by feeding them exclusively upon (1) Raw, (2) Pasteurised and (3) Sterilised Milk.

No. 1.—The large rat on the left was fed exclusively on raw milk, and weighed 13-oz., at the time this photograph was taken at 276 days old.

No. 2.—The one in the middle was 275 days old, and weighed 10-oz. and was fed exclusively on pasteurised milk. Observe its staring coat and unthrifty appearance.

No. 3.—The rat on the right was litter brother to No. 1 and was fed exclusively on sterilised milk and weighed only 5-oz. at 276 days old.

'This picture tells it own tale, and should, I think, convince all but the most sceptical that heat destroys much of the nutritive value of milk.

'Therefore, I strongly advocate that raw milk only should be recommended, and that of a safe variety.

'Just a word for the farmer producer, who, I regret to say, scarcely gets a penny back for the one he spends in producing milk at its present price. The distributor makes about double the price he pays the farmer for the produce. Further, very many farmers have greatly improved their cleanliness in milk production, and others have tested their cows and eliminated all tuberculous cows from their herd. This all means extra expense of production.

'When they offer their milk for sale they are met by the distributor with the reply, 'We cannot pay you any more for your milk than we pay others, as it is no advantage to us, as we clean all milk, except the graded milk.'

'This is absolutely untrue, as dirty milk cannot be cleansed, and once dirty it is always dirty.

'With regard to the graded milks, especially Grade A (Tuberculin Tested), I deeply regret that the public have never been taught the value of this milk over all other, and consequently they do not appreciate it. The result is that many thousands of gallons are produced annually which have to be sold at a great loss as ordinary milk, the distributor having no call for the quantity at present produced, they having to pay the producer 4d. per gallon beyond the price paid for ordinary milk.

'In conclusion, may I suggest that Dr. Brewer shall utilise the existing legal enactments for the distribution and production of milk, and, in his capacity as Medical Officer of Health, advise the adoption of such of them as would secure for Swindon the milk supply so much desired.

'It would mean that Dr. Brewer would have to give more of his time to administrative duties, and leave the executive or practical duties to those officers who have received special training and are therefore experts in their particular departments.

'John C. Coleman, M.R.C.V.S.,
Veterinary Inspector,
Borough of Swindon.'"

Milk Recording.

A British Friesian cow, Chaddesley Hedge Rose 2nd, heads the roll of honour in Volume 14 of the Ministry of Agriculture's Register of Dairy Cattle. This cow, in the herd of Mr. E. G. Barton in Nottinghamshire, yielded 60,702 lb. of milk in the three-year period. The register records outstanding yields which have been checked by the milk recording societies, and may be taken to give a fair picture of the performance of the several dairy breeds, so far as quantity of milk is concerned. It appears that 20 cows in the country yielded more than 40,000 lb. of milk in the three years. The British Friesian breed claims the heaviest milkers, followed by the Dairy Shorthorn and Guernsey breeds.

Warbles.

The observation of a farmer while dressing his cattle, about a 100 head, in order to kill off the warble grubs is worth recording. He found that the young cattle in good condition had very few warble lumps, while those which had not done so well were badly infested. It would be interesting to have an explanation of this, for it is quite possible that the maggots living in the animal through the winter before they make their appearance on the backs may seriously sap vitality. If this is the case there is all the more reason for farmers to press on with the eradication of warbles in their own interest, as well as for the sake of the leather trade. The nuisance which the gadflies cause in the heat of summer is well known. Dairy cows which are continually being stung distress themselves in their mad stampedes, and the milk yield falls.—*The Times*.

Clinical Report.

Avian tumours associated with Retained Yolks in the Oviduct.

By H. P. Bayon.
Molteno Institute for Research in Parasitology.
University, Cambridge.

Introduction.—The principal biological property which distinguishes avian from mammalian tumours is, that sarcomas of the Rous type and the angio-endothelioma described by Begg (1927) can be experimentally transmitted by filtrates. Then in fowls, sarcomas number over half of all observed new growths; this contrasting with the statistics in relation to man, which show that connective tissue neoplasms constitute about 8 per cent. of all cancers. Moreover, tumours can occur in accumulated numbers in a definite strain of hens on a farm, with an incidence which may reach a tenth of the fowl population of that particular breed. This perhaps corresponds to what is called "familial predisposition" in clinical medicine. In addition, particularly in hens, definite seasonal variations have been noted in the frequency of new growths found after killing, the greater numbers being present in the early summer; this is reasonably correlated with the strain of increased egg-production. This observation has been indirectly and experimentally confirmed by Fraenkel (1930) who noted that the filtrate of a Rous-sarcoma was four times more virulent in March, April, July and August than in the four months between November and February.

There are several other distinctions differentiating avian from mammalian oncology, though the general histological features of neoplasms in birds and man are recognizably alike; but it is to be expected that the fowl should be subject to forms of cancer which do not have an exact human counterpart. These are the relatively frequent neoplasms of the oviduct, which, if egg-laying is the domestic hen's occupation, can be justifiably considered avian industrial cancers. Among the tumours of the oviduct those connected with retained yolks should be peculiarly distinctive of hens.

The first description of such neoplasms is to be found in Ehrenreich and Michaelis (1906), who observed multiple round growths in the abdominal cavity of a hen; each nodule contained a central inspissated yolk concretion, surrounded by fibromatous tissue. These authors suggested that the yolks were detached ovarian follicles, which had wandered loose in the peritoneum and eventually became enveloped in connective tissue. The alternative interpretation of later observers of similar conditions has been that a retained yolk in the oviduct, after bursting through the walls, scatters over the peritoneum. Ehrenreich and Michaelis (1906) promised a more detailed description of these interesting neoplasms, which they had often observed; this fuller description I have been unable to trace. The next specific mention of these tumours is to be found in a footnote of Heim (1930), p. 97, where it is stated that these neoplasms "occur not infrequently."

The retention of yolks in the oviduct is relatively common and can be due to numerous causes; but that such a yolk should be associated with a neoplasm is of sufficient general interest to deserve attention, particularly if it has been possible to diagnose the tumour and test its transplantability.

First Observation: Epithelial Neoplasm of the Oviduct.

Rhode Island Red hen, stated to be three years old; sent in as being egg-bound on September 20th, 1927. The comb is dark and congested, the bird appears ill and is weak and emaciated; does not feed. The abdomen is pendulous, swollen, surface red, feathers missing. A hard mass can be felt filling the left side; not movable. The hen is killed and on necropsy the abdominal cavity is found to contain about two tablespoonsful of pale clear yellow fluid, and a large (3-in. by 2-in. by 1½-in.) light pink, firm and slightly knobbed tumour; dilated veins are noticeable on the surface, parts of which are adherent to coils of the intestine and firmly adherent to the peritoneum at the back. The growth is seen to form part of the upper third of the oviduct, which is the albumoid producing portion. A section through the ovoid growth shows the texture to be uniform, soft, pink, except for an excentrically placed inspissated light-yellow yolk, about an inch in diameter and which shows several layers and a dark-yellow centre with chalky deposits. Liver is dark, congested; surface shows numerous pinhead-sized, yellowish nodules; these are also present in the liver substance. Spleen is dark, soft, round, scarcely enlarged; contains no metastasis. A small accessory tumour, the size of a split pea, is seen just below the spleen. Lung, heart, kidneys, do not show any naked-eye alterations. The intestines are practically empty and compressed by the tumour. No intestinal helminths. Femurs are not thickened; marrow is red and succulent.

Microscopically.—Different fields of the same section and sections from various portions of the tumour show histological variations. Under a low power the tissues appear fairly uniform and scantily nucleated; higher magnifications reveal in parts an adenomatous texture, reminiscent of the villous structure of the lining endothelium of the oviduct, consisting therefore of somewhat irregular folds forming cavities lined by slender columnar epithelial cells with an oblong and lightly staining nucleus. These folds or villi are supported by strands of young connective tissue and delicate arterioles. The lumen of the intervillar spaces is filled by a thin mucous fluid. Gradually or suddenly this regular pattern gives way to an active predominance of polymorph epithelial elements and the tissue becomes a compact mass of variously distorted cells, woven in a pattern which resembles a fibro-sarcoma; careful examination shows that this is an example of alteration in the morphology and disposal of the epithelial cells, which now are all in immediate juxtaposition, with scanty and distorted capillaries and no supporting connective tissue scaffolding. In some sections these epithelial tumour cells surround compact masses, about 250μ in diameter, of a yellowish, hyaline, very finely granular substance, presumably yolk.

The metastatic nodules in the liver show a still more evident alteration from the morphology and stromatic disposition of the cells of the original mucosa. Scattered

clumps of polymorph cells are surrounded by compact congregations of infiltrating small round cells. The reaction caused on the surrounding liver tissue is intense.

This gradual change in morphology and histological texture, occurring as the result of increasing malignancy, has been named " anaplasia " as being something distinct from metaplasia, which should denote the transformation of one tissue into another.

This neoplasm resembles those described by Petit (1902), Yamagiwa and Ono (1918); the latter tried to reproduce such tumours by injections of irritants into the oviduct.

Histological Diagnosis.—Epithelial endothelioma with adenomatous features arising from the mucous lining of the oviduct. Whilst in certain parts the tumour retains some of the appearances of the original lining of the oviduct, in others definite anaplasia can be detected which leads to undoubted malignancy.

Transplantation Tests.—Pieces of tumour, finely minced, were inoculated under the skin of both sides of the breast in nine White Leghorn fowls; these were observed for a year, when they were killed; no trace of tumour formation being found. Later experience has taught me that to succeed, such first generation tumour inoculations should have been made in hens of a closely related strain and whenever possible in a position similar to that in which the neoplasm was originally discovered.

Second Observation: Round-celled Tumour of the so-called Lymphosarcoma Type.

Another yolk-tumour was observed in April, 1931; the farmer who sent the carcass for examination had previously lost several birds of the same strain owing to " growths," some internal, others superficial. This Rhode Island Red hen had been found dead two days before; had not appeared ill or sickly, but had ceased laying for some time.

Necropsy Notes.—Comb is purple; the skin is of a natural colour, the flesh is firm, the hen is well nourished. Abdomen swollen, featherless. On opening the abdomen, a smooth, whitish, ovoid, egg-sized tumour is noticed on the left side, pressing on the coils of the intestine and adherent to these and the peritoneum. The tumour measures about 1½-in. by 2-in. by 1½-in., and is found to involve the walls of the upper third of the oviduct; its section is whitish, soft, but contains in its upper ovarial end an inspissated stratified greenish yolk, about an inch in diameter. Lungs, liver, spleen, kidney show no naked-eye alterations, particularly no signs of metastasis. No intestinal helminths. Femurs, if anything, thinner than usual, marrow dark red and diffluent.

Microscopically.—Low power shows a uniformly staining texture, consisting of a background of dark nuclei, similar to the tissue of the spleen or lymph nodes. Higher power exposes a few compact connective tissue septa, some dilated arterioles and capillaries and a mesh of delicate connective tissue fibres; the predominating cell is of about the same size as a fowl monocyte, but differing from these in nuclear structure, which shows a fine network of chromatin; moreover, the cytoplasm is scanty and irregular in appearance. Picnotic alterations are noticeable in many nuclei and disintegration in others—the tissue has obviously not been fixed in a fresh state. Pink, eosin-stained hyaline patches are scattered in the stromatic texture of the growth and simulate necrotic areas. These various alterations are, however, not all post-mortal, for mitotic figures can still be detected in many cells.

Somewhat similar avian neoplasms are commonly classified as lymphosarcomata. In my opinion, genuine lymphosarcomata of the fowl are distinguishable because the texture is more compact, the predominant malignant cell is smaller, stains more darkly and is more regular in size and appearance. Like tumours and allied conditions, lymphosarcomata are apt to occur more frequently in certain strains of hens; the relationship of this neoplastic condition to neurolymphomatosis and lymphocythæmia has been discussed in previous papers. (Bayon, 1930, 1931.)

The malignant cell in the present tumour is probably one of the histiocyte type, whose differentiation from monocytes, if at all possible by morphological criteria, has not yet been accomplished.

Histological Diagnosis.—Rapidly growing round-celled sarcoma, originating from cells of the histiocyte-monocyte series.

Discussion.

Though these two tumours differ considerably in histological type, yet the common feature is that they both contained an inspissated yolk; this could be considered to have had some part in the origin of the neoplasms. For some unknown reason the yolk was retained in the upper third of the oviduct, then clotted or thickened, and in course of time the irritation induced the development of a tumour.

The inverse interpretation can also be offered; a small tumour forming in the walls of the oviduct, hindered the descent of the yolk, which gradually was enveloped by the growing neoplastic tissues.

I feel more inclined to accept the first explanation of the causal connection between yolk and tumour, not only because of the observation of Ehrenreich and Michaelis (1906) which appears to suggest a clear relationship between the yolk and tumour formation, but also because Pentimalli (1930) has shown that egg-yolk when injected intravenously into rabbits, exerts a definitely proliferative action on tissues of the marrow and other organs.

Apart from the scanty observations obtainable as to the behaviour of the hens during life, histologically there could be no doubt that the first tumour was a much slower growing neoplasm than the second; it was unfortunate that an attempt could not be made to experiment with the sarcoma, which might have proved transplantable.

The frequent appearance of neoplasms in certain particular strains has been repeatedly mentioned; this accumulation is apt to suggest the existence of an " infection." Experimental evidence shows, however, that even when dealing with easily transmissible viruses, like that of Rous-sarcoma No. 1, infection of fowls in the same pen is extremely rare. One possible course of dissemination of such tumour-like conditions is indicated by the experiments of Fraenkel (1927) and others, who have shown that the yolk of Rous-sarcoma hens when inoculated will reproduce this tumour.

It may be mentioned that among tumours of the oviduct, the commonest variety appears to take its origin from the unstriped muscles and therefore may possibly be compared with an uterine fibro-myoma in mankind; these are usually benign.

Adeno-carcinomata of the oviduct have been described by several observers and also round-celled sarcomata.

Summary.

Two neoplasms of the oviduct in Rhode Island Red hens are described; these appear to have arisen as the result of irritation set up by a retained yolk. One tumour is considered to have originated from the endothelial lining of the oviduct and so showed but a slight degree of anaplasia, though it caused scattered metastasis in the liver and a secondary deposit near the spleen. This did not prove transplantable on nine Leghorns tried.

The other was a round-celled sarcoma which was growing rapidly and did not cause metastasis.

The relative specimens are preserved in the Institute of Animal Pathology, University of Cambridge.

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Abstracts.

[**Santonin as an Anthelmintic for Swine.** Morris, H., and Martin, J. A. (Louisiana State University, Baton Rouge, La.). *Jl. A.V.M.A.*, vol. lxxviii, N.S., vol. 3, No. 4. April, 1931, pp. 531-538.]

The authors made controlled tests on several series of young pigs with various drugs, such as santonin alone, or in conjunction with calomel, or with calomel followed by purgation with Epsom salts, or with Epsom salts without calomel, santonin with castor oil or B. naphthol, oil of chenopodium, carbon tetrachloride and tetrachlorethylene. Oil of chenopodium and tetrachloride set up toxic symptoms or gastritis and enteritis. Santonin did not have such a good effect on immature ascarides as it did upon adult worms. From the data collected the authors state that the following conclusions might be drawn:—

(1) Santonin, if properly administered, is an effective anthelmintic for removal of *adult* ascarides in swine.

(2) The value of santonin as an anthelmintic for *immature* ascarides should be made the subject of further study.

(3) Results indicate that the efficiency of santonin depends, to a large extent, not upon the amount given, but upon the method of administration and purgation.

(4) Santonin and calomel, as recommended as an anthelmintic for swine, are ineffective, due to lack of proper purgation.

(5) The combination of santonin and calomel, followed in a few hours by a saline purgative, proved to be highly efficient.

(6) Santonin alone, followed by a saline purgative, gives equal results.

(7) The results seem to indicate that santonin in large doses is non-irritating to the digestive tract.

H. G.

[**Experiments on Immunisation against Foot-and-mouth disease by means of Formolised Virus.** Lavrovsky, Babichyev, Lipatov and Silchenko, 1930. *Vyestnik Sovremennoy Veterinarii,* No. 17-18, pp. 423-424.]

The vaccine from formolised virus has been prepared, according to the method described by Vallée, Carré and Rinjard, from mature aphthæ on the upper lip and on the tongue of naturally infected cattle. Out of 294 animals, 72 have been vaccinated once, 192 twice, and there were 36 controls. There was an interval of seven days between first and second inoculation, and 2 c.c. of vaccine have been injected intradermally on each occasion. Thirty-four (47·2 per cent.) cattle vaccinated once contracted foot-and-mouth disease, whereas the figures for cattle which were vaccinated twice and for controls were 31 (16·2 per cent.) and 27 (90 per cent.) respectively. Vaccinated cattle passed through a very mild attack of the disease and could be used for work during the spring sowing campaign, whereas unvaccinated animals contracted the disease in malignant form and, owing to sequelæ, could not be used for work. There were no fatal cases, however, and young stock did not contract the disease. It has been established that double intradermal immunisation protected cattle against natural infection for a period of 2½ months, but the results of single intradermal vaccination were less favourable. Opinion is expressed that further tests on a large scale

Report of the Director of Abattoir and Livestock Department, Johannesburg, 1930.

This important report of Colonel Smith showed that the number of animals which passed through the markets was 1,199,463, the number slaughtered 581,560 and the amount of diseased and unsound food destroyed 772 tons. In addition to the meat from animals slaughtered in the abattoirs over 600 tons of meat were imported. The abattoirs appear to be the centre of teaching meat inspection, as demonstrations were given to 80 district medical officers. An additional veterinary officer has been appointed whose duties include examination of cows, microscopical, bacteriological and biological testing of milk.

Treatment of live animals is carried out by the veterinary staff in the Transport, Cleansing and Biological Departments. Eight dairies in the municipal area, containing 274 cows are kept under supervision for tuberculosis.

The Director's Auctioneering Department sold 4,824 animals during the year.

Cattle Improvements Bill, 1930.—Owners of stock can send their animals to any licensed auctioneer or direct to the Director for sale. The Bill, if it be complied with, compels the seller to sell stock by live weight and the buyer to buy by live weight and removes the option that has previously existed. This is similar to the Argentine method.

Mechanical Slaughter of Animals.—Good reports are given as to the results of experiments with the Temple Cox and Schermer apparatuses. The slaughter of small animals with a mechanical killer is considered unsatisfactory, due to "unnecessary delay and being no more humane than the present system." Some doubt still exists as to the effect of bleeding in shot pig carcasses and further tests are required to determine this point.

The City of Johannesburg has adopted a resolution similar to that of the Corporation of the City of London, *viz.*, "That if the mechanical killer is to be insisted upon it must be applied to slaughtering everywhere in the country."

Diseases observed on Post-mortem Examination.—An interesting appendix gives the diseases observed in carcasses and organs, from which it is apparent that tuberculosis is not very common in Johannesburg. For example, out of 125,264 cattle and calves only 23 carcasses were taken as unfit for food, and out of 70,120 pigs only 239 carcasses. On the other hand, parasitic diseases appear to be more common than here as, under the heading "*Cysticercus bovis and cellulosæ,*" 468 bovine and 2,677 porcine carcasses were destroyed. Under the heading "Caseous lymphadenitis" 1,366 lungs and seven livers were destroyed, but not one carcass: evidently this disease is regarded as one affecting the organs only; if so, this is not in accordance with observations on sheep carcasses sent from South Africa to Smithfield market, where in a small consignment a fairly high percentage of the disease was observed in the lymph glands of the carcasses.

T. D. Y.

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should be made in order to establish definitely the practical value of this method of immunisation.

H. F.

N.V.M.A. Divisional Report.

Central Division.

Presentation to Mr. E. L. Stroud.

The Fellows of the Central Veterinary Society assembled in large numbers at 10 Red Lion Square on the evening of Thursday, May 7th, 1931, for a meeting which was made the occasion for expressing, by presentation, a sense of the Society's indebtedness to a valued member of long standing in Mr. E. Lionel Stroud, who has rendered the "Central" yeoman service for extended periods, first as Hon. Secretary and then as Hon. Treasurer, with a term in the Presidential Chair in the memorable year (1904) which witnessed the holding of the International Veterinary Congress in London.

The President (Captain G. Dunlop Martin) occupied the Chair, and there also present: Captain L. S. Balls, Mr. A. J. Beeson, Mr. W. Brown, Captain R. Bryden, Mr. H. E. Bywater, Mr. R. E. C. Bullen, Major T. Dalling, Major W. Denington, Messrs. R. E. Glover, S. Gourley, H. W. Griffiths, Major T. Hicks, Mr. J. W. H. Holmes, Mr. H. D. Jones, Mr. H. King, Miss E. G. Knight, Dr. P. P. Laidlaw, Colonel B. L. Lake, Captain J. H. Mason, Dr. J. McCunn, Mr. J. W. McIntosh, Major-General Sir John Moore, Mr. W. Perryman, Mr. F. Proud, Dr. A. L. Sheather, Miss K. W. Shedlock, Lieut.-Colonel P. J. Simpson, Captain R. J. Stow, Mr. E. L. Stroud, Major F. J. Taylor, Major R. C. Tennant, Captain W. K. Townson, Mr. D. E. Wilkinson, Mr. R. A. Willett, Mr. C. E. Woodrow, Professor G. H. Wooldridge, Professor J. G. Wright and Captain J. F. Macdonald (Hon. Secretary).

Visitors.—Mr. J. K. Bateman, Mr. J. J. Davies, Captain S. R. Douglas, Mr. G. R. Galbraith and Dr. R. A. O'Brien.

The minutes of the February and April meetings of the Division, which had been published in the *Record*, were taken as read and were confirmed and signed.

Correspondence.—(1) From Major G. W. Dunkin, Mr. Geo. Gould, Junr., Captain S. J. Motton, Mr. Mark Tailby, Captain S. Villar and Major R. F. Wall, apologising for their inability to attend the meeting. Major Dunkin, in the course of his letter, stated that he expected to be in New York on the evening of the meeting, and that on the following night he hoped to attend the meeting of the New York Veterinary Society, when it would be his pleasure to convey greetings from "Central" Fellows and from his other British colleagues. (Hear, hear.)

(2) From the Secretary, N.V.M.A., enclosing and supporting a communication from the Secretary, R.C.V.S. (also read) urging the discontinuance on the part of any member of the profession who might be pursuing it, of the reprehensible practice of inserting, on their notepaper and account forms, letters other than those indicative of the possession of a professional or academic qualification.

Lieut.-Colonel Simpson proposed "That the Division expresses its agreement with the sentiments contained in the communications received from the Secretaries of the N.V.M.A. and R.C.V.S."

Dr. Sheather seconded the proposition, which was carried unanimously, and the Hon. Secretary was instructed to reply to Mr. Knight accordingly.

Morbid Specimens and Cases of Interest.

Professor J. G. Wright exhibited viscera of a nine-year-old male Scottish terrier which had been the subject of the operation of gastro-enterostomy. The terrier had been suffering from obscure vomiting for the previous six months, and it was eventually decided to perform a laparotomy. This was done and it was found that there was a growth in the vicinity of the pylorus, the size of a walnut. They anastomosed the duodenum with the smaller curvature of the stomach. Healing took place very rapidly and the animal was discharged from hospital seven days after the operation. No vomiting had occurred and the dog took liquids readily. On the 11th day after operation the owner brought the dog back, when it was in such an emaciated condition that it was destroyed.

On *post-mortem* it was found that perfect union had taken place—in 11 days—between the stomach and the duodenum. Dr. Hare made the *post-mortem*, and in his pathological report he stated: "The enlarged lymphatic gland found at the operation area—the pylorus of the stomach—was hypoplastic, and probably represented a compensation for the loss of lymphadenoid tissue in the mesenteric glands. The cause of this mesenteric adenitis was not found."

The reason for his bringing that case forward was his view that they should be more ready, in some of those cases of obscure but continuous vomiting, to endeavour to perform an operation of that kind, because it gave one hope when one found that healing took place so readily and so rapidly in this case, despite the fact that the subject was nine years old and was greatly emaciated at the time of operation.

Dr. A. L. Sheather said that he had two specimens which he would like to show to the members of the Society. The first was the urino-genital organs of a fox terrier. The history of the case is as follows. The dog belonged to a friend of his, and he had known it since it was a puppy some 11 years ago. The dog had only one testicle properly descended and that was a small one. He never showed any desire to serve a bitch, and, he believed, had never been known to do so. About a year ago it was noticed that he was followed by other dogs, and dogs in the neighbourhood used to wait outside the house barking. This became such a nuisance that it was decided to destroy the dog. He went to fetch it in his car and there was then waiting outside the house an Airedale, barking vigorously. He put the dog quickly into the car and drove off, and the Airedale followed for nearly half a mile before giving up the chase.

At the *post-mortem* examination it was noted that the teats were developed and were very large; they measured about half an inch in length, but no mammary tissue could be found in the subcutaneous fat. There was a small cyst-like body from which about two c.c. of fluid escaped at the base of the hindermost teat at the right side.

The right testicle was normal in position but very small, as could be seen from the specimen. The left testicle was larger and was situated in the groin just external to the inguinal canal. The other organs appeared to be perfectly normal.

After fixation the testicles were divided mesially and it was found that the larger size of the left testicle was due to the presence of cysts in it.

Sections were cut from each and presented the following characters: The right testicle contained only a small amount of tubular testicular tissue, and the tubes were lined with a single layer of cells. In the rest of the gland the inter-tubular connective tissue could be made out obscurely, but all arrangement of the epithelial cells was lost, and there was a considerable invasion of the tissue with small rounded cells. The disarranged epithelial cells stained very imperfectly.

The left testicle was for the most part composed of cells—the appearance of which suggested that they were endothelial in origin. No definite walls could be made out round the cysts.

The second specimen was one that was extremely rare, if not actually unique. It was a case of scirrhous cord due to tuberculosis. He received this specimen from Mr. Hoban, veterinary surgeon, of Whitchurch. Mr. Hoban informed him that the specimen was obtained from a two-year-old colt which was castrated about a year ago, and which subsequently did very badly, and developed the lesion of the cord. On *post-mortem* examination the specimen which they had before them was found, and typical tuberculous lesions as large as eggs were present in the spleen. Tubercle bacilli were present in the lesions in large numbers. He reported to Mr. Hoban and suggested that he should publish an account of the case, and he gathered from the editorial representative that he had received that from Mr. Hoban.* Although Mr. Hoban was publishing an account of the case, he kindly gave him his permission to show the specimen. It was interesting and no doubt important to note that the farm where this colt was, had a number of cows among which tuberculosis was rampant.

It seemed to be clear that the primary infection took place in the spermatic cord, and that the splenic lesions represented an extension from this.

Mr. G. H. Livesey exhibited a specimen which was received with great interest by the members. It was, said Mr. Livesey, not exactly a fossil, but a bone which was picked up from underneath the foundations of the Royal Palace at Greenwich: the original buildings on the site were stables, he believed. The exhibit was, he thought, a ruminant's jaw, and there was definite evidence that here was a bone that had been excluded from the air, under deep foundations, for at least 300 years: it could not have been disturbed at any time since.

Major F. J. Taylor expressed a particular interest in the case Professor Wright had introduced that evening, having been the subject of that operation himself 20 years ago. He remembered that 12 hours after the operation was performed—it was a gastro-jejunostomy—he was affected with violent, uncontrollable vomition. The surgeon ascribed the vomition to nervousness and prolonged anæsthesia (over four hours) which he (Major Taylor) attributed also to fear of breaking the glove stitches in the stomach, which, however, the surgeon assured him it would be impossible for him to do, and that complete anastomosis would take place in 48 hours. The con-

* Mr. Hoban's account of this case appeared in the *Veterinary Record* of May 9th—page 542.—Ed.

fidential reassurance of the surgeon was successful in immediately removing the desire for emesis.

The President described the series of specimens exhibited as most interesting. That shown by Professor Wright did show that they should be more courageous in opening those cases of prolonged vomition in the dog. In that connection, he had a case of prolonged vomition, which he could not check, in an Airedale dog, two or three years ago. He could not arrange for an X-ray, but they opened the dog. Nothing was found, however, but the vomition stopped forthwith and the patient did extraordinarily well from that time.

The case of tuberculous schirrous cord related by Dr. Sheather brought home a very important point. Dr. Sheather had said that it was important to note, in connection with that case, that the farm where the colt was, had a number of cows among which tuberculosis was rampant. He (the President) did not know whether the veterinary profession could do anything in the way of propaganda in regard to that matter, but he did think that it was high time that pressure were put on the authorities to make the powers under the Dairies and Milkshops Order *compulsory* and not merely permissive. He put that suggestion forward for the consideration of Members of Council present.

Professor Wright said that he was very interested in Dr. Sheather's sexually depraved dog. A short time ago a six-year-old dog, which had been in that state for three months, was presented at the College. The teats were becoming pendulous, while the testicles were atrophied, and the condition of the skin was beginning to show those changes (that " elephant hide " appearance) which Professor Wooldridge had told them that he found to be associated with thyroid deficiency.

Dr. Sheather observed that he might have mentioned that the dog had eczema all over his abdomen, very badly.

Professor G. H. Wooldridge said that in many of those cases response to the administration of thyroid extract by the mouth had been very extraordinary, *i.e.*, in some of the alopecia cases alone, apart from any discoverable parasiticism.

The tuberculous specimen was very interesting. It was rather unfortunate that Dr. Sheather himself had been unable to make the *post-mortem*, because, had he been able to do so, his theory of infection from the scrotum might have been better supported. It seemed to him (Professor Wooldridge) that infection might have been by the mouth and organisms in the blood being arrested in the cicatrising wound, unless it took place at the time of operation. He did not suppose that there was any attempt at typing the bacilli in this case, but it would have been interesting to determine whether they were of bovine origin, or, since one of the members of the family was infected, whether it came from him—probably the former. One had known of instances where pigs had been infected from human sources.

Dr. Sheather observed that Mr. Hoban, in his letter, had said that there was no history of that animal ever having had any milk. With regard to the infection of pigs with human bacilli, he had come to the conclusion that the method of infection was very likely the habit that castrators had of holding the knife in the mouth: a farmer had told him that his customary method of disinfecting his knife was to spit on it. (Laughter.)

Major Taylor said that about a week ago a three-year-old cat was brought to him for castration, and on removing the testicles he found them both to be the subject of well-established tuberculosis. He advised the owner that the cat should be destroyed, but on *post-mortem* he found tuberculosis in no other part of the body.

The President thought that the case recounted by Major Taylor was of great interest. *Apropos* the peculiar sexual appetite to which other speakers had referred, he had often met with cases of castrated male cats which attracted male cats very nearly as much as would the female. He was rather at a loss to account for that.

Mr. Livesey stated that, in conformity with the President's experience, a castrated cat that lived next door to him was chased by all the toms, and he could not find any way to stop it. The cat had a peculiarity which might have something to do with the attraction: if it got on a soft rug it acted exactly as if it were an uncastrated male, and evidently the sexual instinct in that animal had not been destroyed as a result of castration.

The President thought it might be worth while to feed such cats with testicular gland extract, for instance, in the hope that it would alter the attraction which, though castrated, they appeared to show for uncastrated male cats.

Election to Fellowship.—Major W. B. Howe, R.H.A. Barracks, St. John's Wood, N.W., was unanimously elected a Fellow of the Society, on the proposition of Sir John Moore, seconded by Major J. J. M. Soutar.

Presentation to Mr. E. L. Stroud.

The next item on the agenda was the very popular one of the presentation to Mr. E. Lionel Stroud of handsome " grand-mother " clock.

In making the presentation, the President said that he had great pleasure in acting as their spokesman in asking their late Treasurer, and also their one-time Secretary, to accept that small token of their regard and their exceeding gratitude to him for the great amount of work he had done, so willingly and so faithfully, for the Society over so many years. (Cheers.)

He was sure they all owed Mr. Stroud far more than they could hope adequately to acknowledge, but he would, on their behalf, request his acceptance of that clock, with the very best wishes and regards of the Fellows. (Loud cheers.)

Mr. E. Lionel Stroud, in acknowledgment, said that he thanked the President most sincerely for the very kind words he had used in making that presentation to him, and all of them for the very cordial and hearty manner in which they had endorsed their President's remarks.

As their President had said, he had been for some years an officer of that society. He was elected Secretary at the outbreak of the Boer War, which started on October 11th, 1899. Mr. (now Colonel) Mulvey, who, he was glad to say, was still with them, was the Secretary at that time, and when Colonel Mulvey went to South Africa in connection with that campaign, he was appointed in his place.

He had the honour, in 1904, of being elected President of the Society, and it was in many ways a memorable year. For one thing, it was the year of the holding of the International Veterinary Congress in London, when

the Central Veterinary Society entertained some of their colleagues from the Continent. The year also witnessed the opening of the Veterinary School in connection with the University of Liverpool, and he had the honour as their President, of replying, on that occasion, to the toast of the Veterinary Profession, which was proposed by The Rt. Hon. Walter Long, President of the Board of Agriculture.

At the end of his Presidency he was appointed the Society's Hon. Treasurer, and he felt very proud of the fact that from October, 1905, up to last October, when he resigned the office, he had retained their confidence, as was shown by his continuous re-election. (Hear, hear.)

As was inevitable, during the long period of his association with the Central Veterinary Society, they had lost many prominent and useful members. Only the other day he was looking at a photograph taken in his presidential year at the annual dinner, and he was sorry to say that nearly half of that company had since journeyed to that bourne from whence no traveller returns—Salisbury Price, Joseph Woodger, Matthew Clark, " Jimmy " Rowe, Porch, Rogerson, Butters and their late Secretary, Hugh MacCormack, were there. All of them were men who accomplished outstandingly good work for that Society. (Hear, hear.) On the other hand, he was very glad to see that some Fellows present at that dinner were in that room that evening—Walter Perryman, whom he might describe as evergreen (hear, hear), and Mr. King, who did not age at all—then, there was their dear old friend, Professor James Macqueen, while Percy Smith and Jack Willett were also at that dinner.

He had been very proud indeed to work in the old days with those who had helped to bring that Society to the high position in which it was at the present time.

For that very handsome clock they had been good enough to give him he thanked them, and all who had subscribed towards it, very much indeed. It would serve to remind him of the many happy hours he had spent at Red Lion Square in connection with the activities of the Central Veterinary Society.

He accepted it with the greatest of pleasure as an outward and visible sign of their appreciation of what he had done for the Society, and assured them that to do anything for the Central was always, with him, a real labour of love. (Cheers.)

Paper.—In calling upon Major T. Dalling to present his paper, entitled " Further Observations on the Laboratory and Field Aspects of Canine Distemper Immunisation," the President extended a warm welcome to Captain S. R. Douglas, Dr. P. P. Laidlaw and Dr. R. A. O'Brien.

[Major Dalling's paper, and a report of the discussion, which was opened by Dr. P. P. Laidlaw, are reproduced at the commencement of this issue of the *Record*.—Ed.]

At the termination of the discussion the President said that it was with very great pleasure indeed that he rose to propose a hearty vote of thanks to Major Dalling for so kindly coming there and giving them the benefit of his observations on distemper immunisation. He was sure that the preparation of such a paper must have entailed a tremendous amount of work, and the Society were exceedingly grateful to him. (Applause.)

The vote of thanks was accorded by acclamation, as was a similar tribute to those who had brought forward interesting cases and specimens.

The President now rose to say that he was sure that, before breaking up that evening, the Fellows would like to join with him in congratulating Colonel Simpson on the honour which had recently been conferred upon him in his election as President, N.V.M.A. (Cheers.) All of them were very pleased indeed and all felt that it was an honour well deserved. (Hear, hear.) On their behalf, therefore, he desired to congratulate Colonel Simpson and to wish him the best of luck in his year of office. (Cheers.)

Lieut.-Colonel P. J. Simpson, in acknowledging the compliment, expressed his grateful appreciation of the President's words and of the reception which had been accorded them by the Fellows of the Society. It was a very great honour indeed to be placed in the position of President of the " National." He had only a short term of office, as that terminated in August, when the Congress would take place, but during that time he would do his best to further the interests of the Association in every way open to him. (Applause.)

The passing of a vote of thanks to the President for his conduct in the Chair terminated the proceedings.

J. F. Macdonald, *Hon. Secretary.*

Irradiated Milk.

Professor K. Scheer, of Frankfort University, has been sounding the praises of irradiated milk for the prevention and curing of rickets and other maladies in children. In eight large University children's clinics in Germany, this curative influence has been established, so that Germany has confirmed the findings of Dr. Chalmers Watson, Findlay, King, and others in this country. But apart from the curative effect of irradiated milk on rickets, the German scientist stresses the special tonic value of such milk, this having been attested by the Public Health officers in Frankfort and other centres. In the municipal children's home in Frankfort with 90 beds, every drop of milk used in the past 18 months has been irradiated, and the results have been so striking that with such an effective agent at our disposal the Professor advocates that one of the most important and profitable tasks for public health authorities in future should be the carrying out of not merely the treatment of rickets but large scale prophylactic measures against the malady. Some time may yet have to elapse before such steps come into practice, but it is a pointer as to how the tide is running. The opinion and findings of the German Professor must be gratifying to enthusiasts in this country. But those who are aware of the remarkable improvement that has been effected in the grading up of the ordinary milk supply, as is evidenced in the report of the Fenwick tests, might be pardoned for expressing the view that were a great deal more of that milk used in our cities less would be heard of rickets.—*North British Agriculturist.*

The council of the Royal Society for the Prevention of Cruelty to Animals has decided to make a grant of £500 to the Old War Horse Fund, which exists for the humane destruction of these animals.

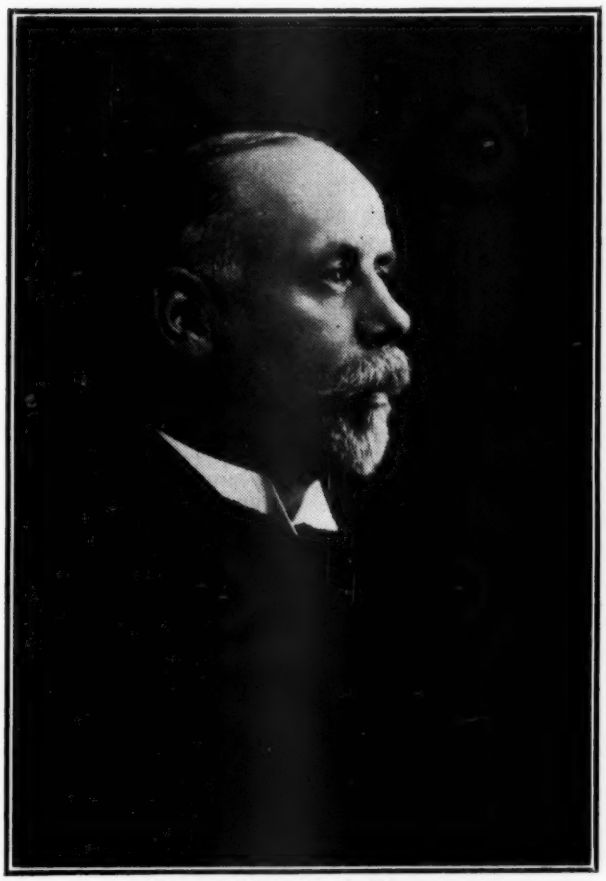
A Horse Show will be held on July 9th at Woolwich to assist regimental and local charities. Full particulars, and entry forms for open jumping, polo pony, and hunter classes can be had on application to the Hon. Secretary, Woolwich Garrison Horse Show, R.A. Barracks, Woolwich, S.E.18.

The Late Mr. H. J. Dawes.

His Life and Work.

Tributes to His Memory.

The passing of few members of the veterinary profession in this country in recent years has created a more widespread sense of loss than that of Mr. Henry James Dawes, F.R.C.V.S., which took place at his residence, Camden House, West Bromwich, on Tuesday, May 26th, and which we had the sad duty of recording in our last issue. The great range of his interests and activities within the profession, pursued as these were, not only with vigour but with the kindliness of a sympathetic and attractive personality, brought him an exceptionally large circle of friends, who respected and valued him highly for his integrity, his judgment and his knowledge of veterinary work and affairs. Indeed, one of the chief characteristics of Mr. Dawes was his talent for making lasting friendships, for he possessed a breadth of vision which always made him the welcomed friend of his fellows, both young and old, in the profession.



The Late Mr. H. J. Dawes.

Henry James Dawes was born in West Bromwich 67 years ago, and though none of his relations was connected in any way with the veterinary profession, he elected to serve a pupilage before entering the London College and taking his diploma. For some years he was with the late Mr. Stanley, of Birmingham, but immediately after qualifying, on April 1st, 1885, he started practice on his own account in his native town of West Bromwich. There he practised continually throughout the remainder of his life, making for himself a reputation for good work and sound common-sense, which extended throughout the Midlands and beyond. As an expert in shoeing he was in demand at many of the larger shows in the capacity of judge, and in any advances of real scientific value to veterinary medicine and surgery he was always, as a keen observer and an enthusiast, foremost amongst demonstrators of new methods. Mr. Dawes became a Fellow of the Royal College of Veterinary Surgeons in 1892. His son, Howard, has followed in his father's footsteps and, since he qualified in 1913, was invaluable to him in the working of a large and varied practice.

For many years the late Mr. Dawes was closely associated with every movement of importance that has taken place within our ranks, and this association is proof of the confidence and esteem in which he has always been held.

It is given to few of us to realise many of our ambitions, but from the early days of his career Mr. Dawes had always held fast to the ideal of a great, united veterinary association, which would stand out as representing the ideals and aims of the profession as a whole. In his presidential address to the Midland Division, delivered by him so long ago as August, 1898, Mr. Dawes made the following statement: "There are certain questions of general interest to us as veterinary surgeons upon which I should like to venture an opinion, and first and foremost is that of the proposed affiliation of the various veterinary medical societies of the kingdom with the National Veterinary Medical Association. The idea, as most of you are aware, had its origin in some remarks made by a past president of our own Society, and I think it is one which has in it all the elements of good. Such a representative body would be able to deal effectually with any question which concerned the welfare of the profession, and succeed in adjusting a grievance or removing an evil when individual organisations might often fail. It need not interfere in any way with the regular work of the existing societies, and the financial difficulty, which alone seems to stand in the way of bringing the matter to a successful issue, is one which ought readily to be overcome."

Mr. Dawes saw this pioneer work result at last in the successful establishment of the National Association,

and it was a fitting tribute to the man who expressed those views some 33 years ago that he was elected to the presidential chair of the N.V.M.A. in 1924. Of his period of Presidency we wrote at the time: " His value to our Association cannot be measured in words. His presidency has occurred at a time when it was very important that our senior officer should be a man with a wide knowledge of men, and of our profession and its needs, a man who would use himself unsparingly to attain the objects we have in view; a man who both by precept and example would work for the unity and consolidation of our profession through the medium of the Association. Mr. Dawes fulfilled all these requirements, and added not only a capacity for business, but a wonderful tact in the management of the many meetings over which he has presided. The result has been that our machinery has run smoothly and expeditiously, and the general efficiency of the Association has benefited."

In 1925, at Cambridge, Mr. Dawes was elected to the Honorary Secretaryship of the N.V.M.A., and to the time of his death he continued to apply, in the service of the Association in that capacity, those outstanding qualities of mind and heart which had distinguished his Presidency.

In fact, however, we need not look further than Mr. Dawes' " home country " for evidence of his zeal for the ideal of the achievement of unity within the profession. In this connection, we wrote of Mr. Dawes in 1929: " He has thrown himself whole-heartedly into the life of the two Associations—each great in its sphere—of which he is the esteemed Honorary Secretary. Mr. Dawes' work in that capacity for the " National " Association is known and appreciated by every member of the parent body, but it is, after all, the prerogative of the Midland Counties Veterinary Medical Association to claim him as its own." The occasion was the presentation made to him at the Annual Meeting of that Division on February 8th, 1929, of a gold cigarette case and silver rose-bowl in recognition of his remarkable and unrivalled record of 37 years' service as Hon. Secretary of the Division—a service which he was also to continue to the end.

Mr. Dawes had a large experience of the educational side of our profession. Elected to the Examining Board of the Royal College of Veterinary Surgeons in 1903, he was an examiner for the Membership Diploma, in the subject of Stable Management and Shoeing, for many years. For some considerable time he was chairman of the Board of Examiners for the Class B examination, whilst he had been a member of the Board of Examiners for the Fellowship Diploma since 1916.

During the war Mr. Dawes was elected a member of the Military Tribunal set up to hear applications for exemption from service by veterinary surgeons, and his intimate knowledge of the varying conditions of practice was of the greatest value to his colleagues.

He was also keenly interested in the work of the Victoria Veterinary Benevolent Fund, of the Council of which he was a member.

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" To be added to the list of West Bromwich notabilities who have passed from this life during 1931 there is now the name of Mr. Henry James Dawes, the well known veterinary surgeon, who died on Tuesday evening, leaving behind him a widow, a son, and two daughters," says the *Midland Chronicle* of May 29th, in the course of an editorial notice. " We feel sure our readers, and the townspeople generally, would wish to join with us in an expression of very deep sympathy with Mrs. Dawes and her family in their irreparable loss.

" The late Mr. Dawes was a very familiar figure in West Bromwich, of which town he was a native, and though the part he took in the public life of the town did not bring him into the limelight to any great extent, he nevertheless found a little time, in the midst of a strenuous professional career, to do some valuable work, both in the interests of the several ' unprofessional ' movements with which he was associated, and for the good of the town itself. It was characteristic of Mr. Dawes that with whatever object or project he allied himself it received his full and enthusiastic support, and his influence and sound commonsense reasoning always made themselves felt to some advantageous purpose. There are many who believe that had Mr. Dawes had time to devote himself more to matters of a public nature he would have been a decided acquisition to the town's quota of ' voluntary workers,' and it is beyond question that he would never have lacked support in any phase of public activity with which he might have chosen to place his services at the disposal of the townspeople.

" In his professional capacity as a veterinary surgeon of knowledge and practical ability, it is probable that the late Mr. Dawes led the Midland ' field.' At any rate there are few members of the profession who can claim a greater knowledge of the varied interests and aims of the veterinary profession, or to have gathered round him a wider circle of friends and acquaintances in the course of a praiseworthy career. He was one of the oldest members of the Midland Counties Division of the National Veterinary Medical Association, and no member was more highly esteemed and respected.

" Mr. Dawes was never the man to be content to remain a figure-head, whether the responsibilities he undertook were of a professional character or otherwise, and it was probably his keenness and enthusiasm with which he entered into everything with which he associated himself that won for him so many friends. No man could have made more lasting friendships in an all-too-short span of 67 years than Mr. H. J. Dawes, and his loss will be felt more keenly when the shock of his passing has subsided."

In its obituary notice in the same issue, the *Midland Chronicle* adds the information that the late Mr. Dawes was prominently associated with a number of local movements, including the West Bromwich Horse Show Committee, of which he had been chairman since its inception, and had missed hardly a single show in the whole of its history.

In religious circles he was associated with Christ Church, West Bromwich, all his life, and served for many years as a churchwarden.

The Interment.

The veterinary profession was strongly represented at the funeral, which took place at Christ Church, West Bromwich, on the afternoon of Friday, May 29th. The church was well filled by representatives of the local authorities and the public bodies with which Mr. Dawes had been associated, and the Vicar of Christ Church (the Rev. N. S. Kidson) assisted by the vicar of St. Philip's (the Rev. W. Solly) and the Rev. E. N. Thomas, crystallized the thoughts of many when he spoke of Mr. Dawes as one who, having attained front rank of his profession, won and retained the esteem and respect of his fellow townsmen.

The veterinary surgeons present included Lieut.-Colonel P. J. Simpson (Maidenhead), President of the National Veterinary Medical Association and representing both that body and the Royal College of Veterinary Surgeons; Mr. J. L. Cormack (Coventry), Major F. Chambers (Wolverhampton), Mr. W. Woods (Wigan), Major F. Leeds Gooch (Stamford), Mr. W. Trigger (Newcastle), Mr. J. Martin (Wellington), Mr. J. W. Conchie (Kidderminster), Mr. J.

Robertson (Stourbridge), Mr. L. Heelis (Solihull), Mr. W. Brooke (Handsworth), Mr. S. M. Woodward (Birmingham), Mr. Brennan de Vine (Birmingham), Major J. Abson, D.S.O. (representing Mr. F. Bradley Abson, of Sheffield), Mr. H. Yeomans (Smethwick), Mr. H. W. Griffiths (Moseley), Mr. L. Tipper (Birmingham), Colonel Tom Marriott (Northfield), Messrs. A. Forsyth, senr., and A. Forsyth, junr. (Cannock). Mr. G. A. Payne represented the National Master Farriers Association.

Representatives of public life in the borough included the Mayor (Councillor W. T. Poultney), the Deputy Town Clerk (Mr. T. L. Ralphs), Aldermen J. E. Cox, T. Cottrell, J. Wheatley, J. Bell, Councillors C. B. Adams, J. Shaw, A. G. Garratt, S. Crump, and Mrs. Caldwell; Mr. A. Wilkes and many Brethren of the Dartmouth Lodge of Freemasons; Mr. A. D. Greatorex and members of the West Bromwich Horse Show Committee, and many members of the public.

In Parliament.

The following questions and answers have been recorded in the House of Commons recently :—

Horse-Drawn Traffic.

Mr. Mills asked the Minister of Transport whether, before issuing any further regulation prohibiting horse-drawn traffic in certain areas of London, he will consult all the trades dependent on this industry with regard to any such restriction on their usage?

Mr. W. B. Taylor asked the Minister of Transport whether he has now received the report of the London Traffic Advisory Committee with regard to the representations made by various bodies in connection with the restrictions on horse-drawn vehicles proposed in the draft Oxford Street regulations; and whether he can give an undertaking that modifications, satisfactory to all interested parties, will be made before these regulations are brought into force?

Mr. Parkinson: I am informed that the London Traffic Advisory Committee have recently had a meeting with representatives of the National Horse Association and of a number of other organisations concerned with horse-drawn traffic. My right hon. Friend will receive in due course a report from the committee on the representations made by these bodies among other representations and objections which have been received in respect of the proposed London Traffic (Oxford Street) Regulations. It may not be possible to meet the wishes of all interested parties, but every consideration will be given to their representations.

Sir W. Brass: Will the hon. Member take into consideration the unfairness of slow-moving traffic holding up the whole of the traffic?

Mr. Parkinson: All such considerations are taken into account by my right hon. Friend.

Mr. McShane: Is the hon. Gentleman aware that a general slowing-up of traffic would be to the well-being of the general public?

Lieut.-Commander Kenworthy: Is the hon. Gentleman aware that horses stop traffic altogether in some streets?

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Milk (Infection).

Mr. L. Smith asked the Minister of Health what steps, if any, he proposes to take to deal with infection by milk, in view of the new departmental memorandum on bovine tuberculosis in man?

Mr. Greenwood: I am considering this question in consultation with my right hon. Friend the Minister of Agriculture and Fisheries.

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Poultry (Diseases).

Lieut.-Colonel Heneage asked the Minister of Agriculture what tests have been carried out to discover whether the diseases to which domestic fowls are prone are imported through eggs imported from foreign countries, and what results have been obtained?

Dr. Addison: I know of no such tests which have been carried out.

Imported Meat Regulations.

Mr. Thorne asked the Minister of Health the date of the rescission of the order made under the Public Health Meat Regulations, 1908, prohibiting such imports as boxed loins and legs of pork, boneless beef, and other forms of scrap meat used by sausage manufacturers; the reason for the original prohibitions; and what fresh facts were disclosed to justify the rescission?

Miss Lawrence: The Public Health (Foreign Meat) Regulations of 1908 and 1909 were revoked in 1925, but their substance was re-enacted with slight modifications by the Public Health (Imported Food) Regulations, 1925.

The importation of scrap meat (*i.e.*, meat which affords insufficient means of identification with definite parts of a carcass) is still prohibited, the reason for the prohibition being that such meat cannot be satisfactorily inspected at the time of importation. Boxed loins and legs of pork have never been regarded as scrap meat, and their importation has always been allowed if they are accompanied by official certificates recognised as satisfactory by the Minister of Health. The official certificates of a number of countries have been recognised for this purpose at various dates from 1909 to 1929.

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St. Kilda (Wild Birds).

Mr. O. Lewis asked the Secretary of State for Scotland if he will consider whether steps can be taken to ensure that now that the island of St. Kilda is no longer inhabited it is preserved as a sanctuary for wild birds?

The Secretary of State for Scotland (Mr. William Adamson): I have received a communication from the proprietor of St. Kilda indicating that it is his desire that bird-life on the island should be fully preserved, and I am in sympathy with that object. I do not, however, think that it is practicable for the Government to undertake any scheme for the establishment of a sanctuary, under regulation, in the island, which, as I have already indicated, is private property.

Earl Winterton: Has the right hon. Gentleman gone into the matter of whether it would be possible to provide some form of police protection, at the time when the steamers visit the island, in order to prevent the indiscriminate slaughter of birds which appears to have been going on since the island was vacated?

Mr. Adamson: I am not aware that there has been any indiscriminate slaughter of birds since the island was vacated.

Earl Winterton: Is the right hon. Gentleman aware of the threatened destruction of two species, or at least one species, peculiar to the island; has he read the correspondence which has appeared on the subject, and will he give sympathetic consideration to a matter which is in no sense a party matter?

Mr. Adamson: I have already indicated my sympathy.

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Bracken (Eradication).

Sir A. Sinclair asked the Secretary of State for Scotland whether any progress has been made with the production of a parasite or fungus, which will be innocuous to other vegetation, for the destruction of bracken?

Mr. W. Adamson: No fungus so far investigated as a parasite on bracken has proved to be of practical utility as a means of eradication, but intensive research into bracken disease and experiments in methods of eradication are being continued this year. The possibility of damage being caused to other vegetation by any agency affecting bracken will be carefully tested.

Messrs. A. and C. Black, Ltd., have just published the 10th Edition of *Black's Medical Dictionary*, completing 82,000 copies. This 10th Edition has been thoroughly revised and its 1,000 pages contain 588 illustrations in the text and two full-page plates in colour.

Notes and News.

The Editor will be glad to receive items of professional interest for inclusion in these columns.

Diary of Events.

June 8th.—Meeting of the Editorial Committee, N.V.M.A., at 2 Verulam Buildings, Gray's Inn, W.C.1, 4.30 p.m.

June 15th-20th.—D.V.S.M. Examinations.

June 17th.—Meeting of the Lancashire Division, N.V.M.A., at Liverpool University.

July 2nd.—R.C.V.S. Annual Dinner.

Aug. 22nd-28th.—N.V.M.A. Congress at Norwich.

A "Jubilee" Dinner.

The same post that brought members, R.C.V.S., news of the ballotless election contained reminders of two events of quite exceptional interest and importance. As this year is the fiftieth anniversary of the passing of the Veterinary Surgeons' Act, 1881, the R.C.V.S. Annual Dinner will have the added dignity of a jubilee function. We hope that all members will signify, by their presence at the Hotel Victoria on July 2nd, their sense of the historic importance of the occasion, as those responsible for the function have done in making possible the following announcement:—

"Among the distinguished guests who have promised to be present are:—

"H.R.H. the Duke of Gloucester (who has graciously promised to propose the toast of the Royal College), the Rt. Hon. the Lord Mayor of London, the Sheriffs of the City, the Minister of Agriculture and Colonel Sir George Courthope (chairman of the Agricultural Committee of the House of Commons), the Presidents of the Royal Society, Royal College of Physicians, Royal College of Surgeons, National Farmers' Union, etc."

Members of the College may bring a limited number of guests, and early application should be made for tickets (15s. each) to the Secretary, R.C.V.S., 10, Red Lion Square, London, W.C.1.

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Memorial to Sir Frederick Smith.

The second reminder relates to the decision of the Council of the R.C.V.S. to promote a suitable memorial to the late Major-General Sir Frederick Smith, and took the form of the subscription appeal issued by the Committee instituted for the purpose. No one can have read the outline of the career and achievements of the subject of the proposed memorial which appeared over the signature of the Chairman of the Appeal Committee—Sir John M'Fadyean—without being moved to participate in a project designed worthily to honour the memory of one of whom, in the words of the appeal, "it can be truly said that no man of his generation deserved better of his profession, or rendered it greater service."

Personal.

Professor James Macqueen.—We have much pleasure in informing our readers that the week-end is likely to witness the happy termination of Professor James Macqueen's prolonged stay at the Hampstead General Hospital in his return to his home in Camden Road, N.W. On Sunday last our esteemed Past-President left his bed for a short while for the first time for many months since his operation. His general health is described as satisfactory, and there is thus every prospect that we shall be able 'ere long to welcome him amongst us once again.

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King's Birthday Honours.—The veterinary profession is represented in the list of honours conferred by the King on the occasion of his sixty-sixth birthday, by the award of the *Imperial Service Order* (*Companion*) to George William Sturgess, Esq., M.R.C.V.S., Government Veterinary Surgeon, Ceylon. (Colonial Office List.)

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Mr. R. J. Roe, Chief Veterinary Officer, Cyprus, arrived home on leave on May 28th.

R.C.V.S. Obituary.

Harrison, Henry Charles, The Downs, Bowdon, Cheshire. Graduated London, April 2nd, 1881. Died May 27th, 1931; aged 72 years.

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In Memoriam.—At All Saints' Parish Church, Market Weighton, on March 28th, a stained-glass window was unveiled by Mr. Arthur Rowntree, and dedicated by the Reverend Canon Ollard, in memory of Robert Ian Alexander Hickes, son of Mr. R. J. Hickes, J.P., F.R.C.V.S., of Market Weighton. Mr. Hickes' son was killed after six months' service in the Air Force, just before the Armistice.

Correspondence.

Fowl Paralysis.

To the Editor of The Veterinary Record.

Sir,—In the *Veterinary Record* of May 23rd, you published an article on fowl paralysis, by Marginson and McGaughey, which is of deep interest to workers in these Laboratories, for we have had similar experience suggesting egg transmission. For the past six months my colleagues and I have have been in touch with poultry farmers whose flocks have been affected with this disease and, up-to-date, from a study of clinical features, epizootiology and the gross and microscopic pathology we have confirmed the existence of fowl paralysis in 10 flocks in England. In each case the losses were heavy and the disease tended to spread rapidly. In addition to these outbreaks we suspect the presence of the disease on the farms of many poultry keepers with whom we have been in touch, and we are in agreement with the above authors when they state "this disease is more prevalent in England than was previously suspected and its further spread seems probable." The Scientific Poultry Breeders Association have made arrangements for investigation into poultry diseases, and in connection therewith, we have carried out field observations and, by using suitable material in the field, have investigated the disease in the laboratory, especially from a transmission point of view. It is hoped to publish a full account of our work in due course.

I am,
Yours faithfully,
Thomas Dalling.

Wellcome Physiological Research Laboratories,
Langley Court,
Beckenham,
Kent.

June 1st, 1931.

The Editor acknowledges the receipt of the following:—

The 1931 number of the *Annual Magazine* of The Union Society, Royal Veterinary College, London.

The Centaur (the Magazine of the Royal "Dick" Veterinary College, Edinburgh) Vol. 1, No. 3.